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IN *the first number of* THE AMERICAN NEPTUNE *it was stated that 'the field of action will include the Americas, North and South, and the journal, although published in the United States, will include, in so far as possible, studies of the maritime history of Canada and Hispanic America.' In the present issue Mr. Philip Ainsworth Means describes and illustrates the primitive craft used along the Andean coast before the Spanish conquest, and Captain Oscar Tagle summarizes the history of a gunboat of the Uruguayan Navy. It is hoped that these two contributions, which came from opposite coasts of South America and are many centuries apart, will induce other readers to contribute articles dealing with the many phases of maritime activity in Hispanic America. Captain Tagle's article is printed in Spanish, with a brief introduction in English.*

A certain number of our 1941 *subscribers have, because of military and naval service, been unable to renew their subscriptions, and since the war has moved to the Far East we have lost contact with other subscribers there. The loss is no greater than would be anticipated under present conditions, but the Editors hope that readers will endeavour to obtain new subscriptions, by calling the* NEPTUNE *to the attention of libraries and*

individuals that might be interested. Although a number of our contributors are now on active duty in the armed forces or engaged in other forms of war work, the supply of articles submitted for publication is still very satisfactory. In the present issue two of the queries published in the January 1942 *issue are answered from England. Captain Blackman of the Royal Navy comments on a chant for timing salutes, and Mr. Wardle, although the greater part of his records are stored for safe keeping, sends from Liverpool information about the packet ship* Julius Caesar. *The promptness of these answers is encouraging, for it shows that even under present conditions the* NEPTUNE *still travels and is still read.*

Because of the length of articles in the present issue, the publication of the bibliography of maritime articles which appeared in serials during 1941 *has been postponed until July. The Editors and certain members of the Advisory Board have divided among themselves the work of searching a considerable number of publications for articles to be listed, but any readers who know of articles published during* 1941 *in serials that might have been overlooked are cordially invited to send in a record of them. This record should include the author's name, title of the article and the volume and page reference to the serial in which it was published. From time to time articles of considerable importance appear in most unlikely places. If any number of these are reported to the Editors during the next two months, the delay in publishing the bibliography will have become a positive gain.*

Captain Codman on the Mutiny in Dorchester Church, and the Seamanship of Saint Paul

BY SAMUEL ELIOT MORISON

CAPTAIN John Codman (1814-1900) was one of the well-known characters of nineteenth-century Boston. His father the Rev. John Codman, orthodox pastor of the Second Church of Dorchester, sent him to Amherst College in order to avoid contamination with Harvard liberalism, and in the paternal hope of making a minister of him. Theology, however, was not to young John's taste; and after reaching the sophomore year with the class of 1835 he left college to follow the sea. He was second mate of ship *Carolina* in 1837, and later commanded ship *William Penn*, steamer *Quaker City*, and numerous vessels in the China trade. After his retirement, about the year 1870, Captain Codman continued to own vessels that were highly successful, and divided his time between Boston and New York, a ranch in Idaho and a cottage in Cohasset.[1] He wrote frequently to the newspapers on subjects that interested him, such as ship subsidies, the navigation laws, and taxation.

In 1876 Captain Codman entered a controversy about the exemption of religious property from taxation. The following letter of his to the *New York Evening Post* was a rejoinder to some correspondent who said that seamen had no business mingling in religious questions:

To the Editors of the Evening Post:

The New York *Observer* has devoted a leading editorial more than a column long to a criticism, not so much of my communication to the *Evening Post* on the subject of Church Taxation, as to the right of a nautical man to discuss any matters of interest alongshore. Under the head of 'A Sailor Out of His Reckoning' it goes on in this wise:

Captain Codman is a capital commander of his own craft, but as a critic of the Church he sails without chart or compass. Evidently he is out of his latitude. On the

[1] Sketch in *Other Merchants and Sea Captains of Old Boston* (Boston: State Street Trust Company, 1919), p. 12.

quarter deck he is at home and master. But to navigate the Church he don't understand the ropes.

Noah, the first navigator on record, is still regarded as pretty good authority in religious circles, notwithstanding a fondness for wine and women, of which our profession is generally accused. Saint Paul, whose early acquaintance with seamanship was doubtless acquired from the Greek skippers who had business with him at his sail-loft, was enabled in an emergency to take the command out of the hands of the captain of a Roman transport, and to save the lives of her passengers and crew.

Captain John Newton, who acquired a high reputation as a skilful commander of a slave ship, was afterward a distinguished minister of the Gospel, and that venerable seadog G. W. Blunt, whose *Coast Pilot* is the most valuable literary production of its kind, has also enlightened the world on every conceivable subject, religion included. I did not, therefore, regard it as an excess of temerity to dip my oar into fresh water, even if thereby Governor Dix was made to 'catch a crab' in his efforts to paddle the Church out of difficulty.

The *Observer* seems to imagine that sailor must be a sort of web-footed albatross or a dolphin sculling about the ocean totally ignorant of what is going on upon the land. To discuss sectarianism is totally beyond his element.

I assert for myself, however, an intimate knowledge of the subject. I was born and bred in its atmosphere, educated in sectarian schools and sent to a sectarian college, from which, after two years, I made my escape to the ocean, and was even then, on my first voyage, pent up on board of a ship with eighteen sectarian missionaries. Yes, I know all about sectarianism.

The old meeting-house in my native town in Massachusetts was built as a speculation, and realized double its cost in the sale of its pews. My honored father was its first minister. He was a clerical martinet, and would not allow anything that he considered false doctrine, heresy or schism to be preached from the pulpit—his quarter-deck. Some of his congregation insisted upon an occasional treat to liberal theology, and at last resorted to actual violence to accomplish their end. One Sunday my father on entering the church found a Unitarian minister established in the pulpit, and the old-fashioned gangways on either side occupied by his opponents, who blockaded his entrance and guarded the interloper from ejection. Forewarned of the event, my resolute parent had provided himself with a pocket Bible and hymn-book. He took his stand upon the lower platform and began the usual services, his powerful voice drown-

ing the attempted interruptions of the clergyman above him. Fortunately, the choir as well as the church members were upon his side. The opening hymn having been given out, as soon as the bass-viol commenced its preliminary twang my father was about to sit down, when one of the enemy, reaching over the baluster of the staircase, attempted to pull the chair from under him. In a broad-aisle pew sat old Captain Foster, a retired shipmaster, a pious, excellent Christian and an exemplary member of the church. He observed the dastardly attempt, and, for the instant forgetting his profession of faith, imagining himself on his old quarter-deck confronted by a mutiny, he rose excitedly and doubling his fist exclaimed: 'Davenport, drop that chair, or, by G-d, I'll shake your d----d liver out of you!' The cowardly Davenport instantly removed his hand from that chair, and when a few days afterwards Captain Foster was tried before 'the standing committee,' after a suitable apology for his intemperate language, he was excused on the ground of 'extenuating circumstances.' The result of this affair was that there was a division of the church, the opposition retiring and building another meeting-house, so that there were two untaxed edifices instead of one.

The old sore was not healed for very many years. It was the curse of our childhood and the bane of our early years. We were never allowed to play with Unitarian boys, and, what was harder to endure, the parents of Unitarian girls prohibited them from receiving any attentions from us. We were brought up in a horor and detestation of each other. In passing a Unitarian house we gave it a wide berth, and when the little Unitarians passed ours they looked at it askance, expecting to see a personal devil at the window. This was the condition of society produced by sectarianism in the town of Dorchester, now a part of the city of Boston. And it prevailed in a greater or less degree all over Massachusetts. To it Episcopalianism is in a large measure indebted for its rise and progress in Boston. It became a sort of neutral ground, for it did not posses the austerities of Calvinism while it maintained much of its doctrinal belief, and it allowed the amenities of Socinianism, without adopting its creed. Thus the young people who, like Romeo and Juliet, belonged to opposite factions, when they became enamoured of each other compromised matters by becoming Episcopalians.

If in this somewhat prolix article I have wandered away from the subject of church taxation, which for the future I leave to abler hands than mine or those of the New York *Observer*, I trust that I have contributed to the entertainment of your readers by discoursing on the sectarianism of other days, and showing that it is a luxury of animosity which, so far

from deserving immunity as an article of home industry, should contribute to the revenue of the country.[2]

J. C.

This sprightly letter naturally attracted a good deal of attention, and provoked much comment in the *Evening Post* and other journals. One of these comments was by George W. Blunt, proprietor of the famous *American Coast Pilot*. Mr. Blunt remarked that not only should seamen lay off theology, but that parsons should not interfere in nautical matters, and as a bad example of that sort of thing he animadverted severely on the advice given by Saint Paul to the captain and seamen on his famous voyage. This stirred up both the salt and the theology in the blood of Captain Codman, and he replied with a delightful paraphrase of *Acts* xxvii, that deserves something better than oblivion in newspaper files.

To the Editors of the Evening Post:

The readers of the *Evening Post* cannot fail to appreciate the erudition and practical wisdom of Mr. Blunt. His proposition to survey the Gulf Stream because he regards it as an American institution will meet with general approbation. True, he has satisfied himself that in all oceans at a depth of fourteen hundred fathoms below the surface the temperature of the water is exactly thirty-four or thirty-five degrees. Professor Aronnax could not have been more precise. It seems even possible that 'G. W. B.' may have accompanied that hero of Jules Verne in his voyage of *Twenty Thousand Leagues Under the Seas*, assuming the character of Ned Land, who handled his harpoon with a vigor equal to his grasp of the pen. It is singular that while the historian of that remarkable cruise has been so minute in his general description of submarine depths, he has given us a very unsatisfactory report of the Gulf Stream. He says of it: 'Its mean depth is fifteen hundred fathoms, its mean breadth ten miles.' Of the temperature of the water he says nothing, although we may infer from the great variety of fish seen that the water below cannot be so hot as at the surface, unless they swim in a boiled condition, which is quite as likely as many other wonderful incidents chronicled in that veracious log. As, however, the thermometer seems to have been neglected by Captain Nemo, of the *Nautilus*, it is manifestly of the greatest importance that a naval expedition should be fitted out at once for the purpose of determining whether at the depth of fourteen hundred fathoms the temperature of the Gulf Stream is thirty-four or thirty-five degrees.

[2] New York *Evening Post*, 22 April 1876, p. 1a; also in the *Evening Post, Semi-Weekly:* 28 April, p. 2d.

But while in the main agreeing with Mr. Blunt not only in this matter but in all others, especially those of a nautical character, on which he writes, it grieves me to see that he again refers to the Apostle Paul as 'no sailor.' As this is a question of seamanship, I hope the theologians will leave 'G. W. B.' and myself to 'straddle the chest' and have our mull out by ourselves. I wish to adapt the twenty-seventh chapter of the Acts to his comprehension and to that of other old salts before proceeding to comment upon it. I shall therefore put aside the English version of the time of King James, and make a nautical translation.

1. And when they had concluded to ship us to Italy they turned Paul and the other prisoners over to a corporal of the marines named Julius.

2. And going on board of a ship belonging to Adramyttium we cast off from the wharf and made all sail, keeping close in to the Asiatic shore. A Macedonian gentleman by the name of Aristarchus was a cabin passenger.

3. Next day we touched at Sidon. Julius was very polite to Paul, and gave him a day's liberty to go ashore and be treated by his friends.

4. We got under weigh again and beat up along the Cyprus shore with the wind dead ahead.

5. We got a fair slant over the sea of Cilicia and Pamphylia, and then put into Myra.

6. There the corporal found an Egyptian ship hailing from Alexandria, bound to an Italian port, and he shifted us and our dunnage over to her.

7. She was a slow old tub, and after a long passage we just fetched Cnidus, and as we could not weather Crete we ran down to leeward of it till we made Salmone.

8. Hauling upon a taut bowline so that we just passed to windward of it, we ran into Fair Haven, not far from Lasea.

9. Now, d'ye see, we had made a long voyage of it altogether, and as it looked squally ahead and there were signs of bad weather, Paul called all hands aft, and says he:

10. 'Shipmates, this looks like a bad business; and if we keep on it looks to me as if this ship and cargo will come to grief, and maybe we'll lose the number of our mess.'

11. But the corporal thought that the skipper and the owner knew more about these things than Paul.

12. And so, every fellow having something to say about it, the majority concluded that, as this was not a very comfortable place to winter in, they had better heave up the anchor and make sail for Phenice and winter there. That is a Cretan port and has two channels, one to the northwest, and the other to the southward and westward of it.

13. And so, when the light southerly breeze sprang up, they got under weigh and kept along the Cretan shore.

14. But soon the wind hauled round to the northward and blew great guns.

15. As soon as the gale struck us and we found she would not lay up to the wind, we up helm and scud her before it.

16. And getting under the lee of Clauda we had hard work to get the boat we had been towing, alongside.

17. But they finally hoisted her up to the davits and passed a belly-lashing round the old ship to thrap her together. And then we got out of the shoal water, having clewed up and furled everything, and let her run before it under bare poles.

18. Coming on to blow harder and a heavy sea on next day, they hove overboard some of the cargo.

19. Next twenty-four hours coming in hard gales and sea increasing, all hands and passengers turned to and have hove overboard all the gear lying about decks.

20. Weather so thick that we could not get a meridian altitude of the sun nor a lunar observation for several days. Gale still continuing. Chances look pretty bad.

21. In the mean time Paul had not given any more advice, but now he called the officers together on the poop and said 'Well, gentlemen, you had better have taken my advice and laid quietly at your anchor in Crete, and then it would not have been a case of general average.

22. 'Still, keep a stiff upper lip, and believe me now when I tell you that whatever may happen to the ship, all hands will be saved.

23. 'For the Angel of the Lord stood alongside of my bunk to-night,

24. 'And said, "Don't be afraid. You are bound to get to Cesar, and on your account the whole crew and all the passengers shall be taken care of."

25. 'So gentlemen, don't give up the ship yet, for I believe the Lord will do as he said.

26. 'However, there is no doubt but we shall finally lose the ship.'

27. After knocking about in heavy gales for fourteen days, just about eight bells on the first watch the lookout on the forecastle thought the water was shoaling.

28. So they hove the lead and got twenty fathoms. Next cast they got fifteen.

29. Then to keep her from pounding on the rocks they let go four anchors over the stern, and held on for daylight.

30. Some of the crew thought it would be a good chance to desert when

they had the boat down in the water pretending to run out a stream and kedge anchor to windward.

31. Paul told the corporal and the marine guard that these lads must come aboard again, or else nobody would be saved.

32. Then the marines cut the boat's painter, and let her go adrift.

33. At daybreak Paul ordered the steward to serve out rations, for nobody had eaten anything for fourteen days.

34. 'So I advise you to attend to your mess, for nobody shall lose a hair of his head.'

35. When he had said this he set the example, thanking the Lord, and eating his own grub.

36. That made them all lively, and they made a hearty breakfast.

37. The whole muster roll was 276 all told.

38. And when they had knocked off breakfast they hove overboard the rest of the cargo.

39. At daylight they could not make out the land, but a creek made up inland which they thought might make a good harbor.

40. And when they had hove up the anchors, they slacked up the rudder braces, let fall the mainsail, and run her head on to the land.

41. But she got caught in an eddy that slewed her round so that her bows got hard and fast aground, and her stern was knocked to pieces by the sea.

42. The marines wanted to knock the prisoners in the head to keep them from swimming ashore and escaping.

43. But the corporal, out of regard to Paul, put a stopper on them and ordered all who could swim to strike out for the shore.

44. And those who could not, got on to hencoops, planks and gangway ladders. The long and short of it was that everybody got ashore safe.

Captain Codman adds:

As this is a purely historical narrative I am sure that no one will accuse me of an irreverent application of Scripture. Indeed I am seriously inclined to think that in a Bethel church my version would carry more conviction of truth than that clothed in the old English style of men unacquainted with the language of the sea.

By reference to his Greek Testament the careful editor of *The American Coast Pilot* will be forced to admit the general correctness of the translation. It is mainly because the old one has been the work of landsmen that other seamen besides 'G. W. B.' have ridiculed Saint Paul's claim to seamanship. A careful study of the chapter will show, however, that considering the lack of charts, compass and *Coast Pilots,* these ancient mari-

ners did as well as could be expected under the circumstances, and if they had taken the advice of Paul they would have fared still better. By neglecting it in the first place they lost their ship, but by finally obeying him they saved their lives. The 29th verse is frequently seized upon like a bone by nautical critics. Even Fenimore Cooper makes Captain Truck call the manoeuvre there spoken of, 'lubberly.' I differ entirely with these commentators. The ships of those days were the prototypes of some still in use in the Levant—somewhat less handy in their rig, but much the same in the build of their hulls, their stems and sterns being nearly alike. Their anchors, like many still in use, were of wood, with heavy stones lashed on to their shanks and flukes. They could be dropped from the stern as well as from the bows, as is still often done by these Mediterranean craft, as thus they are brought up more exactly at their anchorage than they can be by the process of rounding to.

I think it quite sufficient in the present article to have explained the meaning of this text without adducing from others direct proof of the seamanship of St. Paul, which may be derived from this chapter and others of the Acts. I commend the whole book to the attentive and earnest perusal of 'G. W. B.,' with the hope that in future he will be more just to the memory of the great Apostle.

New York, May 5, 1876

J. C.[3]

[3] New York *Evening Post, Semi-Weekly:* 12 May 1876, p. 2d. I do not find it in the daily.

Pre-Spanish Navigation Off the Andean Coast

BY PHILIP AINSWORTH MEANS

EVER since 1847, when William Hickling Prescott published his immortal, and still largely valid, description of the Inca empire and civilization in Peru, it has been increasingly well known to informed people of English speech that Peru, before about 1530, had long been the seat of extraordinary and in many respects admirable native American civilizations. The term 'Peru' is not, indeed, accurate; more so is the term 'the Andean area,' which includes the territory now occupied by the republics of Ecuador, Peru, Bolivia and the northern parts of Argentina and Chile.

The area thus defined had had, at the advent of the Spaniards, between 1520 and 1533, some 1,500 years of highly developed native culture. During that long while civilizations had risen and had run their courses and had fallen. This was true not only of the two thousand-odd miles of coast-country along the Pacific but also of the equal length of mountain-country behind the coast, to the east. Some of the civilizations in question were more or less local in scope; but the Incas, between about 1100 and 1530, had built up an amazingly large empire that came to include the whole area. An earlier culture, between about 600 and 900, had spread its influence in art and perhaps also in political ways almost as widely as the Inca civilization afterwards did.

We of today are more fully aware than people of two or three decades ago were that the ancient inhabitants of the Andean area were among the great artists and craftsmen not alone of native America but of the world in their time. So great was the dexterity achieved by the ancient Andeans in pottery-making, in wood-carving, in metal-working, in architecture and, above all, in the textile arts, that their productions (to be seen in an increasing number of our museums) not only fill us with admiration but also impel us to make experiments of our own in those materials.[1]

[1] Among the easily accessible works in English that treat of ancient Andean civilization and art the following may be cited: W. H. Prescott, *History of the Conquest of Peru, with a preliminary*

Skilful though the Andeans of all the pre-Spanish periods were in many ways, they were majestically inept in all matters pertaining to navigation. They were, in fact, utter landlubbers. This was true of all the peoples who dwelt along the two-thousand-mile Andean coast, from what is now northern Ecuador down into north-central Chile. It was true in spite of the fact that, from earliest discernible times down to our own day, the coast-dwellers have been wont to derive a high proportion of their food from the sea. In all pre-Spanish periods fishing from boats off the Andean coast was extensively practised as an important supplement to that part of the popular diet which was provided by really admirable agriculture based on highly developed irrigation-systems.

This being so, one would expect the coastal folk of the Andean area, so clever as they were in other directions, to have worked out during some fifteen centuries before the Spanish conquest a boat-building technique and a sailorman-craftsmanship at least equal to those of, let us say, the Polynesians. Yet, as we shall see, they never did so. The failure of the Andeans in this respect is something which we shall consider later on, in an effort to explain it if possible.

First, however, we must inform ourselves as to the kinds of ships or boats that the Andeans had. In doing so, we run up against another conspicuous lack of theirs, that of a written language capable of providing us with literary descriptions by themselves of their marine architecture and sea-going habits. Save for certain designs on pottery, of which we shall study examples later, the only materials on the subject which we have are the narratives written by Spaniards or by Indians after 1530. Some of these are informative, and we shall now see what we can learn from them.

Captain Pedro de Cieza de León, who travelled widely in the Andean area between 1541 and 1551, made a most careful and discerning study of the native peoples, of their customs, of their history, and of everything else pertaining to them. His *Chronicle of Peru,* the first of whose four Parts was published in Seville in 1553, is one of the Big Four among the chronicles of Peru. He informs us that the Indians of the southern part

view of the civilization of the Incas (New York: Harper and Brothers, 1847, 2 vols.). E. G. Squier, *Peru Incidents of Travel and Exploration in the Land of the Incas* (New York: Harper and Brothers, 1877). A. Baessler, *Ancient Peruvian Art* (Berlin and New York, 1902-1903, 4 vols.). W. Reiss and A. Stübel, *The Necropolis of Ancon* (Berlin, 1880-1887, 3 vols.). Sir C. R. Markham, *The Incas of Peru* (London: John Murray, 1912). T. A. Joyce, *South American Archaeology* (London, The Medici Society, 1912). W. Lehmann and H. Doering, *The Art of Old Peru* (London: Ernest Benn, 1925). P. A. Means, *Ancient Civilizations of the Andes* (New York and London: Charles Scribner's Sons, 1931); *Fall of the Inca Empire and the Spanish Rule in Peru: 1530–1780* (New York and London: Charles Scribner's Sons, 1932); *A Study of Peruvian Textiles* (Boston: Museum of Fine Arts, 1932). H. U. Doering, *Old Peruvian Art* (New York: E. Weyhe, 1936).

of the Peruvian coast (in what is now northern Chile) were wont to go in craft which he calls *balsas* to certain off-shore islands in order to fetch the dung of birds which congregate there by the million. This was the *guano* for which agriculturists have been grateful to Peru from early times down to our own day. In using *guano* as a fertilizer for their fields the pre-Spanish Andeans displayed their great wisdom as farmers. Unfortunately, Cieza does not describe the *balsas* used in carrying to land the precious if not perfumed material.[2]

The Big Four among the Chroniclers of Peru were: Cieza, whom we have just now cited; Garcilaso de la Vega, Father Miguel Cabello de Balboa, and Father Bernabé Cobo, all of whom we shall cite in these pages. Outside this group, but still very important, was the learned and much travelled Jesuit, Father José de Acosta.[3] He describes the boats used in Peru for fishing on the sea. In the 1604 translation by Edward Grimston, as re-issued in 1880 by Clements R. Markham, of Father Acosta's *The natvrall and Morall Historie of the East and West Indies* we find the following quaint passage:

'They [the Indians of Peru] make as it were faggots of bul-rushes or drie sedges well bound together, which they call Balsas; having carried them vppon their shoulders to the sea, they cast them in, and presently leape vppon them. Being so set, they lanch out into the deepe, rowing vp and downe with small reedes of eyther side, they goe a league or two into the sea to fish, carrying with them their cordes and nettes vppon these faggots, and beare themselves thereon. They cast out their nettes, and do there remaine fishing the greatest parte of the day and night, vntill they have filled vp their measure, with the which they returne well satisfied. Truely it was delightfull to see them fish at Callao of Lima, for they were many in number, and every one set on horsebacke, cutting the waves of the sea, which in their place of fishing are great and furious, . . . and beeing come to land they drawe their barke out of the water vpon their backes, the which they presently vndoe, and lay abroade on the shoare to drie. There were other Indians of the vallies of Yca which were ac-

[2] Pedro de Cieza de León, *The Travels of Pedro de Cieza de León, A.D. 1532–50, contained in the First Part of his Chronicle of Peru.* Translated and edited by Clements R. Markham. (London: The Hakluyt Society, 1864), pp. 265-266. For information concerning bird life and allied matters off the Peruvian coast, see: R. C. Murphy, 'Fisheries Resources in Peru,' *Scientific Monthly,* XVI (1923), 594-607; R. C. Murphy, 'Oceanic and Climatic Phenomena along the West Coast of South America during 1925,' *Geographical Review,* XVI (1926), 26-54; R. C. Murphy, *Bird Islands of Peru* (New York: G. P. Putnam's Sons, 1925).

[3] For information about all the old Spanish chroniclers of Peru to be cited here, see: P. A. Means, 'Biblioteca Andina,' *Transactions of the Connecticut Academy of Arts and Sciences,* XXIX (1928), 271-525.

customed to goe to fish in leather, or skinnes of sea-wolves, blowne vp with winde, and from time to time they did blowe them like balles of winde, lest they should sinke.'[4]

From this material we gain information regarding two types of fishing-craft. The one, to judge by this description, consisted simply of dried grass or reeds or some other such thing tied into bundles which the user bestrode like a horse, propelling himself with some kind of paddle. Contrivances like this are called *caballitos,* little horses, today because they are ridden astride.[5] The other kind of craft described by Father Acosta is more puzzling, at least so far as his words about it are concerned. From them one gathers that it consisted of inflated sealskins. How they were blown up without recourse to some sort of pump, and how they were used as boats afterwards are points which he does not make at all clear. Off-hand, one would think that to blow up a sealskin with the aid only of the human breath would be akin to trying to inflate a rubber tire in the same way. Nor does this author make it clear how contraptions like 'balles of winde' encased in a bladder of sealskin could be useful as a boat. It suggests at first one of those blown-up rubber animals that are popular at the seaside and in swimming-pools, and anyone who has tried one of them will know how seaworthy *they* are. The truth is, of course, that Father Acosta does not describe clearly or fully this type of boat. Perhaps it will become more comprehensible as we study further material on the subject.

Thus far we have seen references to two sorts of pre-Spanish boats off the Andean coast, the reed rafts and the sealskin floats. From the greatest of the Chroniclers of Peru, the Inca Garcilaso de la Vega, we learn of a third kind of ancient Andean boat. This writer, who ranks high both as a man of letters and as an historian, was born in the Inca capital, Cuzco, in April 1539. His father was a nobly born Spanish officer, and his mother was a niece of the Inca Huayna Capac. *The Royal Commentaries of the Incas,* written by Garcilaso in Spain after 1590, is the most important book about pre-Spanish Peru, its major purpose being that of making known to the world the nature of the civilization built up in Peru by the maternal ancestors of the author.

[4] J. de Acosta, *The Natural & Moral History of the Indies.* (London: The Hakluyt Society, 1880), p. 150. This is the edition by Clements R. Markham, based upon Edward Grimston's translation which was published in London in 1604. The first edition, in Spanish, was published in Seville in 1590. Father Acosta was in Peru between 1569 and 1583. The earliest version of his book was published in Latin at Salamanca in 1588. There is a copy of it in The John Carter Brown Library.

[5] S. K. Lothrop, 'Aboriginal Navigation off the West Coast of South America,' *Journal of the Royal Anthropological Institute,* LXII (1932), 229-256, especially, pp. 238-239.

In one chapter, therefore, Garcilaso tells us all that he can about the navigation of the Incas' subjects. As he is more than a little verbose, we shall consider only the gist of what he says. In this chapter there is precious little material which Garcilaso can draw upon for glorifying his Inca ancestors as he likes to do. He begins by saying that canoes and *piraguas* [dug-outs?] so usual in other parts of America are unknown in Peru because of the lack there of suitable timber for making them. He then proceeds to tell of the sundry devices used by the people for crossing rivers, including bridges and crude ferries of several sorts. He mentions reed rafts as being used upon the sea for fishing, and he says that they were propelled at great speed by means of stout cane paddles which were changed from side to side of the boat with each stroke. In this way, he says, the fishermen went out to sea four to six leagues [twelve to eighteen miles] in quest of their prey.

For carrying cargoes, however, they use a more elaborate sort of craft. This is a raft of logs so arranged that the middle log is the longest, the log on each side of the central one being shorter and so on, symmetrically, to the outermost logs on both sides. 'They do not put up sails on their boats of rushes, for they have no supports to hoist them on, nor do I believe that they would go so fast with them as with their oars; but they hoist sails on their wooden rafts when they navigate the sea.'[6]

The rafts with sails here so imperfectly described by Garcilaso constituted the high spot of pre-Spanish navigation off the Andean coast. We shall learn much more about them as we go on.

From a minor Chronicler of Peru, the Italian Girolamo Benzoni, we learn a little more about rafts with sails, not to mention a wood-cut illustration. How this man born in Milan in 1519 managed, in spite of royal Spanish restrictions against the circulation of foreigners in America, to travel widely in the King of Castile's American dominions between 1542 and 1556 is not known. Yet he did it. Speaking of the northern part of the Peruvian coast, Benzoni says:

'All along this coast the Indians are great fishermen. The boats they use are a kind of raft, both for fishing or navigating, consisting of three, five, seven, nine, or even eleven very slender timbers, forming a sort of hand, with the longest in the middle. They are made of various lengths, and thus they carry sails according to their size; and a proportionate number of rowers. When they are becalmed at sea, they throw bread,

[6] El Inca Garcilaso de la Vega, *The First Part of the Royal Commentaries of the Yncas* (London: The Hakluyt Society, 1869-71, 2 vols.), translated and edited by Clements R. Markham. The chapter in question is Book III, Ch. XVI, I, pp. 258-263.

fruits, and other things overboard as a sacrifice, praying for a fair wind, they being too tired to row any more.'[7]

Benzoni's woodcut of this kind of boat (Fig. 1) can hardly be described as photographic. For one thing, the manner in which the square sail was rigged is not well shown. A little study of the picture makes it clear,

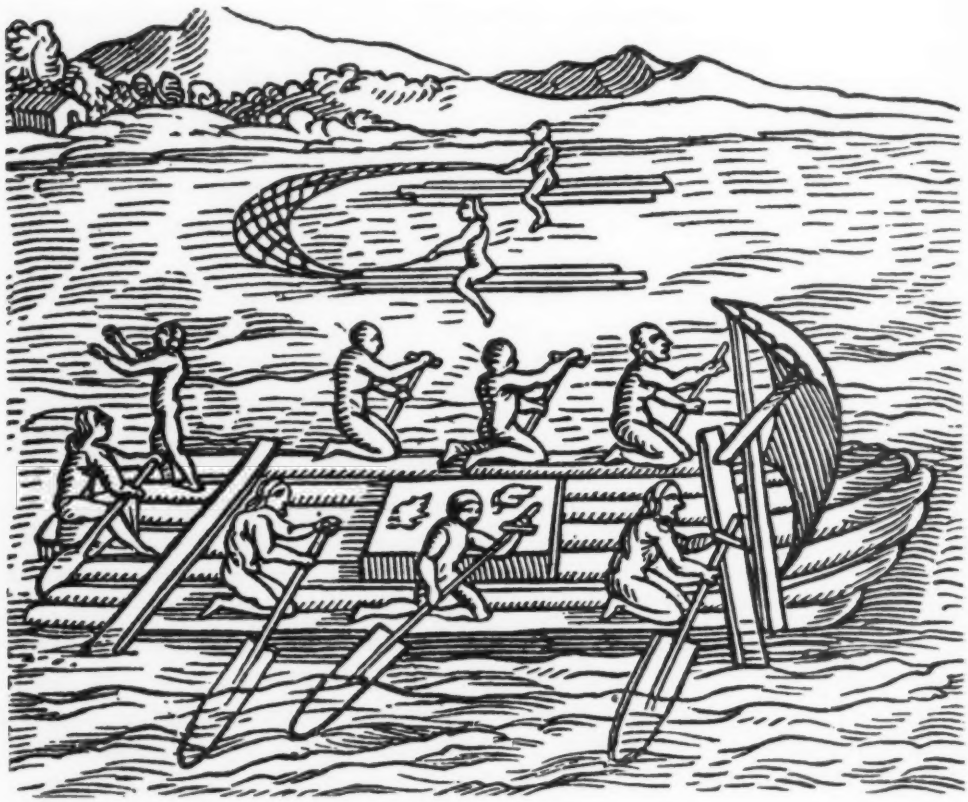


Fig. 1. Woodcut showing *balsas* of different types. After Benzoni, Venice, 1572.

however, in spite of bad drawing, that the sail was held aloft by a pair of poles arranged like an X, there being no indication given as to how the two poles were kept upright. According to this picture, the forward ends of the logs forming the raft were curved upwards, like a spoon, which seems likely not to have been the true manner of them, as it would largely defeat the obvious purpose of causing the raft to be pointed at the bow.

[7] G. Benzoni, *History of the New World,* translated and edited by Rear-Admiral W. H. Smyth from the Venice 1572 edition in Italian (London: The Hakluyt Society, 1857), pp. 242-243.

Likewise, the manner in which the logs of the raft itself were held together is very imperfectly shown: here they are represented as being held together by cross-beams atop of them at bow and stern.

Another of the learned and far-wandering Jesuits who did so much in the sixteenth and seventeenth centuries to inform us of the native civilizations of America was Father Bernabé Cobo. This member of the Big Four of the Chroniclers of Peru was born in Spain in 1582. He went to America in 1596, and arrived in Lima in 1599. There he was educated by the Jesuits and, in due course, he became a member of the Society of Jesus. In pursuance of his duties Father Cobo travelled not only all over the Viceroyalty of Peru (then including the whole Andean area) but also he went into Mexico and Central America. Everywhere he went he kept his attention fixed on the native folk whom he encountered and on every aspect of their civilization, customs, and history. Being a highly intelligent man who habitually viewed strange things without theological wrath, he collected during many years a vast store of information about the native cultures of America and about their history.

In 1642 he settled down in Lima and for eleven years he gave himself up to the composition of his *Historia del Nuevo Mundo,* which he finished on 7 July 1653. It is a marvelous work in which the natural history, the cultures and the human history of Peru and of other regions known to him are admirably treated by Father Cobo. Unfortunately, this great work remained in manuscript for 240 years. Apparently, there was no opportunity for Father Cobo to take it to Spain to get it published. He died in Lima on 9 October 1657. The printing facilities then existing in Lima were, of course, inadequate for printing a work so monumental.

Cobo, in the fourteenth chapter of his fourteenth book, treats very fully of the boats used by the native Americans, particularly of those of the folk of Peru. He describes the canoes and dugouts found in various parts (but not in Peruvian marine navigation); he tells of the plank boats used in southern Chile;[8] he mentions in some detail the reed boats used for fishing and also the inflated sealskin craft. Regarding these he tells us that they *were* blown up by human breath with the aid of some sort of tube; and, he adds, if the skin became too empty while the boat was at sea, the user would re-inflate it with his breath through the tube.

Finally, in the last paragraph of the chapter, Father Cobo tells us about the largest ships known to the Andean natives. These are the large log rafts which were made by the people around the Gulf of Guayaquil,

[8] On these plank boats, or *dalcas,* see Lothrop, op. cit., pp. 244-251. As these boats were used beyond the Andean area in which we are interested, they need not be described here.

where there were forests of large trees of the kind called *balsa*. This sort of wood was exceptionally buoyant in water. The foundation of the *balsa*-ship was a raft of seven, nine or more logs, that in the middle being the longest and the rest being shorter successively so that a crude short of bow was formed. The logs were firmly lashed together with what Cobo calls *bejucos,* meaning long creepers or vines or some such material which were twined together so as to be like ropes. Over the raft proper thus created there was a raised platform whose function it was to lift the passengers and cargo above the logs, these last being awash most of the time.

Fig. 2. A design from an Early Chimu (or Mochica) pot, showing an elaborate reed boat. The original is in the British Museum. After Joyce.

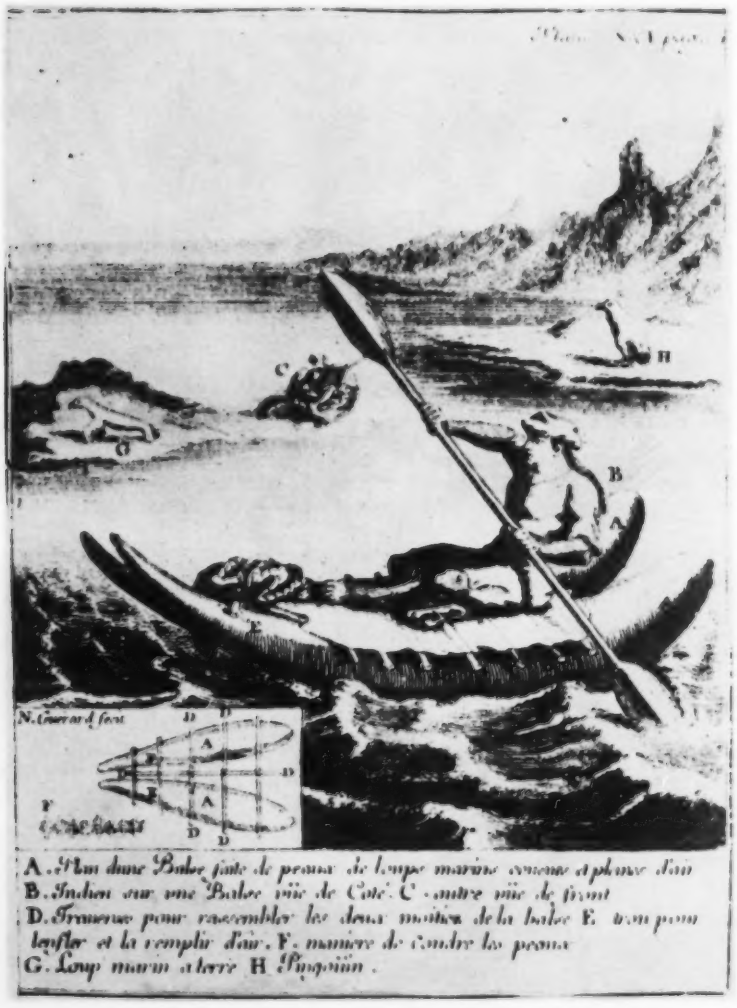
The *balsa* (this word being applied to the ship as well as to the wood composing it) was propelled by a sail and by oars, and some ships of this kind were so large that they could easily accommodate fifty persons. Cobo concludes his description by saying that the chief danger inherent in this sort of craft was that, if it were being used in warfare, and if some treason were afoot, it was an easy matter to cut the lashings which held the logs together so that each log floated free and so unmade the raft. That done, the traitors, if good swimmers, could escape by swimming, leaving the victims to die by drowning. The folk of the island of Puná, at the mouth

An Early Chimu (or Mochica) pot, from Chimbote, showing an inflated sealskin boat carrying three persons

An Early Chimu (or Mochica) pot, from Trujillo, showing an inflated sealskin boat with one person on board

An Early Chimu (or Mochica) pot, from Chicama, showing an inflated sealskin boat with one man on board

The three pots, which are in the Wassermann-San Blas Collection in Buenos Aires, are reproduced by courtesy of Señora Wassermann-San Blas


A. Homme dans Balsa faite de peaux de loups marins comme a planche dun
B. Indien sur une Balsa vüe de Coté. C. autre vüe de front
D. Traverses pour rassembler les deux moitiés de la balsa E. vent pour
enfler et la remplir d'air. F. maniere de coudre les peaux
G. Loup marin a terre H. Pingoüin.

An early eighteenth-century engraving of a double boat like a catamaran composed of two inflated sealskins. This boat was seen off the coast near Arica

After Frézier

of the Gulf of Guayaquil, worked this game against the soldiers of the Inca who were trying to conquer their island.[9]

As already observed earlier in this article, the native Andean civilizations were without written records. In certain of their pre-Spanish periods, however, they produced pottery and other objects with realistic designs upon them, or sculptured in the material, from which designs we can gather a goodly store of information concerning their ways of doing many things. The period richest in documentation of this kind—documentation in the form of paintings upon pottery, for the most part—is that which is today called the Early Chimu, or Mochica, period. It flourished in the northern half of the present Peruvian coast between about the beginning of the Christian Era and A.D. 600 or so.[10]

In Early Chimu or Mochica art we find representations of reed boats and of what appear to be sealskin boats. So far as I know there is no picture of a log raft with a sail; albeit, in the National Museum of Archaeology in Lima, there is a pot surmounted by a modelled design in which a chieftain or other great person is shown to be travelling upon a small raft which is towed by three swimming servitors in very modern-looking bathing trunks.[11]

We shall, therefore, study several Early Chimu pot-pictures of reed boats and of what may be supposed to be inflated sealskin boats.

The first example (Fig. 2) is from a vase now in the British Museum, illlustrated by Captain T. A. Joyce in his admirable book already cited.

A design such as this is likely to awaken nothing but derision in the mind of any true sailor. Fundamentally, however, it shows a man fishing from a reed boat with the aid of partly anthropomorphized birds, one of them perhaps a pelican, and of a long, thick line. The boat itself is almost crescent-shaped, and it is shown as having a fierce looking dragon head at each end. There is no indication of where the water-line would come, nor any of how the queer craft was kept from rolling over, nor any of how it was moved through the water. The fisherman, elaborately dressed, stands, or rather seems to be running at full speed, in a small cockpit with what look like scupper-holes and with a serpent head at one end. How he could run in such confined space and without rocking the boat disastrously one does not know. We should remember, however, that the function of a design like this was to represent some myth or belief cherished by the

[9] B. Cobo, *Historia del Nuevo Mundo* (edited by Marcos Jiménez de la Espada, Seville: Sociedad de Bibliófilos Andaluces, 4 vols., 1890-1893), IV, pp. 215-221.

[10] P. A. Means, *Ancient Civilizations of the Andes*, Chs. II and III. Means, 'Pre-Columbian Andean Art,' *Magazine of Art*, XXXIII (Sept. 1940), 510-515, 544-547.

[11] Figure 3, p. 74, of *Ancient Civilizations of the Andes* shows it.

designer rather than to convey specific information on marine architecture.

This holds specially true of the two pot-paintings next to be studied. They are shown together in Figure 3, taken from an excellent work in German by Dr. Heinrich Doering.[12] Both these pots are from Chicama in the northern part of the Peruvian coast. They were in the private col-

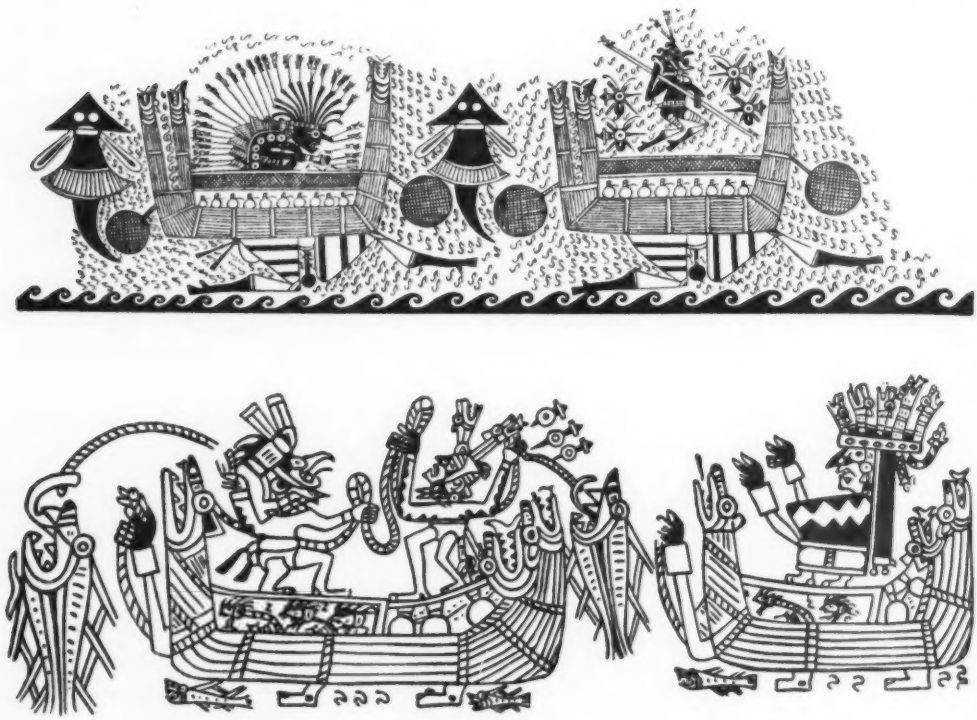


Fig. 3. Two designs from Early Chimu (or Mochica) pots, both from Chicama. The originals are in the Ethnological Museum in Munich. After Doering.

lection of Dr. Eduard Gaffron at Schlachtensee near Berlin, but I understand that they are now in the Ethnological Museum in Munich.

Each of the two designs shows two reed boats. They are accompanied by a great variety of mythological and ceremonial elements which we shall here ignore in order to concentrate upon the boats themselves. All four of these are roughly U-shaped, with decorative dragon heads at

[12] H. U. Doering, *Altperuanische Gefässmalereien* (Marburg, Lahn, Germany: Marburg University, 1926, 2 vols.), II, Plate XII.

both ends. In every case the hull is clearly composed elaborately of firmly bound together reeds. Above the hulls we see a sort of 'tween decks or hold in which supplies in pots and even persons could be stowed. Above the hold comes a deck upon which we see stationed the principal personages on board.

What manner of craft these reed boats can have been and for what purpose beside fishing they can have been used we are at a loss to imagine. Certainly, they were far more elaborate than the small and simple reed rafts seen centuries later by the Spaniards and described by the Chroniclers whom we have cited. These reed boats, with their holds and their decks, must have been of considerable size. To judge by the amount of provender which three of them are shown to contain, they must have been intended for journeys of some length. But this brings up the question of how long would any reed boat successfully withstand the buffetting of the waves. Furthermore, how could so top-heavy a ship without any hint at a keel or other bottom-side make-weight stay right side up? These and other questions that will readily suggest themselves to anyone versed in boat-building are unanswerable in the light of the sçanty evidence provided by these four pictures. In fact, one is strongly inclined to believe that these designs do not represent real boats and that they are merely aesthetic and mythological compositions. This belief is borne out, in the case of the upper one of the two designs, by the fact that the strange-looking legs below the pair of boats shown there are rushing along *above* the waves. Obviously, legs can have nothing to do with any real boat.

It is difficult, or rather impossible, to say what manner of boat the artist intended to represent in making the low-relief design shown in Figure 4. The pot which bears this fishing scene is of the Late Chimu period (*circa* 900-1400) of the northern part of the Peruvian littoral. We may gaze at this picture of an ancient boat as long as we like, and still we shall not know whether it was a bundle-of-reeds raft or whether it was an inflated sealskin. Nor shall we know how it was driven through the waves. We note with amusement that the fisherman wears a distinctly anxious expression; and well he may, for how he managed to keep himself upright and out of the fierce and hungry looking fish mouths all around him passes understanding.

Plate 17 shows us three boat-effigy pots in the large collection of pre-Incaic pottery formed by the late B. J. Wassermann-San Blas, of Buenos Aires.[13] Thanks to the gracious permission of his widow, I am able to

[13] B. J. Wassermann-San Blas, *Ceramicas del antiguo Peru* (Buenos Aires, 1938).

publish these pictures drawn from the very rich Wassermann-San Blas collection.

The first two of these three pictures show inflated sealskin boats of the Early Chimu period. They come, respectively, from Chimbote and from Trujillo, both in northern coastal Peru. It will readily be understood that the handle-spouts of these three pots have nothing to do with the boat element in any of them.

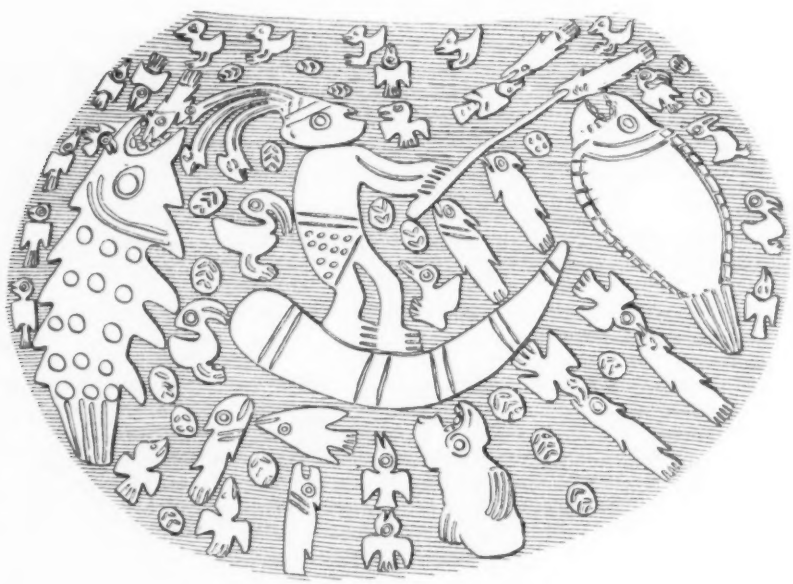


Fig. 4. A low-relief design from a Late Chimu pot, showing a man fishing from an inflated sealskin boat. The original is in the Peabody Museum, Harvard University.

By courtesy of the Peabody Museum, Harvard University, and with acknowledgements to John Howland Rowe.

Plate 17A shows a sealskin boat large enough to carry three persons, two of whom are paddling while the third, in a sort of cockpit at the stern, is simply a passenger. The design painted on the side of the sealskin 'hull' suggests star-fish. The water-line is represented by a series of curly waves, and it is placed so very low down that one wonders, once again, how the craft was maintained in an upright position.

The sealskin boat shown in Plate 17B has but one person on board. He appears to be paddling, but with a paddle too short to be of much

usefulness. Whether he is sitting or squatting is not clear. This boat has elaborate animal-head decorations at bow and stern, reminiscent of the adornments shown in the case of the reed boats which we examined a while ago.

In Plate 17c, the third of these three specimens, we see an inflated sealskin boat with one man on board. He is rowing or paddling vigorously, from a kneeling or crouching position.

In some respects the strangest of the sealskin boat-effigy pots which we shall examine is that shown in Plate 19. It comes from Chimbote and it is now in the Baessler Collection in the Ethnological Museum, Berlin. It is shown by Max Schmidt in his book on Peruvian art and culture.[14]

Here we see an inflated sealskin boat which turns upwards at each end. (One end is left open to permit of the introduction of whatever liquid the pot was intended to contain; but this has nothing to do with the boat-aspect of the pot.) Amidships, the boat has a curious cockpit formed by elegantly wrought slabs of wood which appear to be countersunk into the sealskin in some manner that is not at all clear. In the cockpit sit two men facing one another and having between them a large jar. There is no indication of the method whereby the boat was propelled nor of the manner in which it was kept from rolling over. That it was a fishing craft is made fairly plain by the fact that a large fish of some weird kind is lying on the sealskin just alongside the cockpit; but whether the fish was captured prey or whether it was merely swimming beside the boat one cannot tell.

Fortunately we do not have to depend upon the vagaries of effigy pot makers for our information about inflated sealskin boats. One of the French scientists who visited Peru in the comparatively liberal Bourbon period which, in 1700, followed upon the strictly exclusive Hapsburg period was Amédée François Frézier. He voyaged along the coast of Peru in 1712, 1713, and 1714, and his book about what he had seen was published first in French and then in English not long after his return.[15]

Frézier's picture and plan of a sealskin boat seen by him at Arica appears in Plate 18. There we learn that two inflated sealskins were used and that they were arranged somewhat after the fashion of a catamaran. Across the top of the two inflated skins a crude platform of sticks covered by what appears to have been a hide was arranged, and upon this the boatman was seated. As the two members of the catamaran were so

[14] Max Schmidt, *Kunst und Kultur von Peru* (Berlin: Propyläen-Verlag, 1929), p. 155.

[15] A. F. Frézier, *Relation du voyage de la mer du Sud . . .* (Paris: Nyon, 1716). *A Voyage to the South Sea, and along the Coasts of Chili and Peru* (London: John Bowyer, 1717).

grouped that their narrow ends were together, a sort of bow was arrived at which no doubt helped the boatman in propelling the craft with the aid of his two-bladed paddle.

An actual specimen of the sealskin catamaran exists in The Museum of the American Indian, Heye Foundation, New York. The picture of it given by Dr. S. K. Lothrop in 1932 is reproduced in Plate 19. There we see that the two members are arranged more nearly parallel, neither end of them being conspicuously narrower than the other. The platform

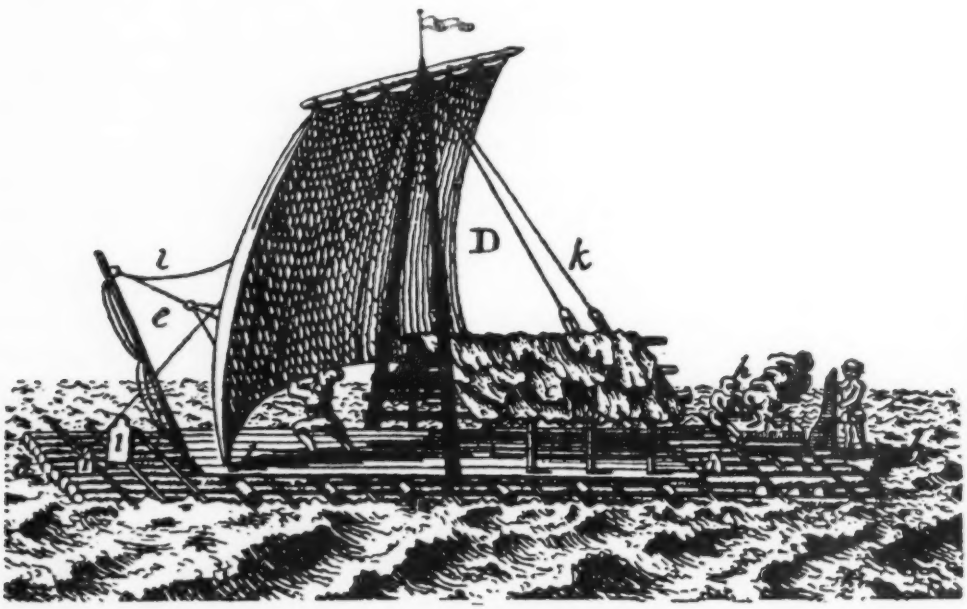


Fig. 5. A mid-eighteenth century picture of a *balsa* wood raft with sails, deck-house, hearth, and centerboards. After Juan and Ulloa, 1748.

above them is a very crude affair of sticks and hide. Very similar is the specimen existing in The National Museum of Natural History in Santiago de Chile, also pictured by Lothrop and shown in Plate 19. This boat still has its two-bladed paddle, recalling that shown by Frézier.

From what has been said before this we deduce that, in pre-Spanish times and later, the people of the Andean coast had but three principal kinds of boats, not counting types used as the result of Spanish influence. These were: 1. Reed boats; 2. Sealskin boats; 3. *Balsa*-log rafts with sails and paddles.

Of these three kinds of early boats the most elaborate and least inefficient was unquestionably the *balsa*-log raft. We shall now consider further the nature of this sort of boat. In Figure 5 we have the picture published in 1748 by the well-known travellers, Jorge Juan y Santacilia and Antonio de Ulloa and reproduced by Lothrop in 1932.[16] Here we see a fair-sized *balsa* raft with a two-part mast shaped like an inverted V. It holds up a large square sail whose rigging is not made clear. Aft of the sail and mast there is a crude deck-house with palm-leaf roof, and abaft of that there is a hearth with a fire smoking on it. This raft lacks the pseudo bow arrangement of the logs which was mentioned above on page 112, and the platform, or deck, extends over only slightly more than half the length of the raft, amidships, and it is very low. A curious feature of this craft is that it has three centerboards, marked 'I' in the picture, as well as a rudder without a tiller in the very stern. The boat is manned by three mariners. According to Lothrop, centerboards were a regular feature of these rafts.[17]

In 1810 Baron Alexander von Humboldt published the picture reproduced in Plate 20.[18] It shows a *balsa*-log raft which, in comparison with most pre-Spanish types of Andean boats, was a veritable *Queen Mary* or *Normandie*. It had no pseudo bow, but it had a large square sail mounted on a two-part mast steadied by stays, a large deck-house amidships, a hearth in the stern, and a large space for freight forward. This sort of raft, which is still in general use on the Guayas River, was undoubtedly the very best kind of ship known to the pre-Spanish Andean navigators. At that, it was obviously a type of boat that would awake nothing but scorn in the breasts of shipbuilders of almost any other maritime people in the world.

Considering the rudeness of their ships, one would expect to find that the ancient Andeans' history and folklore contain few or no references to navigation. There are, indeed, but three major instances of an important part being taken in the history of the Andeans so far as we can claim to be informed concerning it. The earliest of these instances is recorded by the fourth of the Big Four of the Chroniclers of Peru, whom we have not yet specifically cited in these pages. He is Father Miguel Cabello de Balboa, who lived from about 1535 until after 1594. Born in Spain, he went to America in 1566, and thereafter until his last years he

[16] J. Juan y Santacilia and A. de Ulloa, *Relación histórica del viaje a la América Meridional hecho de orden de S. Mag.* . . . (Madrid: Antonio Marín, 1748. 4 vols.).

[17] Lothrop, loc. cit., 235-238 and 250.

[18] A. von Humboldt, *Vues des cordillères et monumens des peuples indigènes de l'Amérique* (Paris, 1810. 2nd ed. 1813), Plate LXIII.

travelled widely and ceaselessly collected information in what are now Colombia, Ecuador, Peru, and Bolivia. He had become a priest before going to America, and his office placed him in a position to make enquiries both among learned clergymen and among the best informed Indians. His celebrated work, the *Miscelánea Antártica,* was begun at Quito in 1576 and was finished at Lima in July 1586. It is a vast treasure of folklore and of miscellaneous learning on the subject of northwestern South America.[19]

Father Cabello de Balboa tells us that the folk of Lambayeque and its vicinity, on the coast north of Trujillo, had a legend which told that, in very ancient times, a chief or king named Naymlap and his first wife, Ceterni, came on a great fleet of *balsas* (*balsa*-log rafts) from the north. With them came many court officials and a great following of men and women. The terms in which this marine migration is described make it very clear that the migrants were not mere primitive wanderers. They were people of advanced culture and of rather well-developed social organization. It is not possible to fix accurately the time of this elaborate migration along the coast southwards to Lamayeque on a fleet of *balsa*-log rafts; but, to judge by what Father Cabello de Balboa tells us of after events, it must have taken place long before the Incas conquered that part of the shore-country early in the fifteenth century.[20]

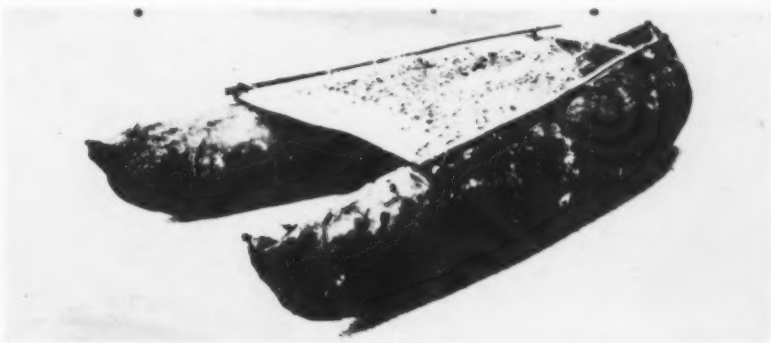
From Father Cabello de Balboa we learn of a grandiose naval expedition westwards from northern Peru towards the end of the reign of the Inca Tupac Yupanqui (about 1448 to 1482). In this connection the great Chronicler is corroborated by another important writer who was an arch-enemy, for political reasons, of the Inca dynasty. This was a skilled Spanish navigator, Captain Pedro Sarmiento de Gamboa, who lived from 1532 to after 1586 and who was in Peru from 1557-1579. His book on Inca history was written under the patronage and influence of the worst enemy the Inca dynasty ever had: the Viceroy Don Francisco de Toledo. It was finished at Cuzco in 1572, and the large, beautiful manuscript of it was sent to Spain to be read by King Philip II. The King, however, did

[19] It is unfortunate that there has never been a good and complete edition of all three Parts of the *Miscelánea Antártica.* A rather poor French version of parts of Part Three was published in Paris in 1840, edited by Henri Ternaux-Compans, with the title, *Histoire du Pérou.* Of that version a translation into modern Spanish was published in Lima in 1920, edited by Drs. Carlos A. Romero and Horacio H. Urteaga. The most complete text of the *Miscelánea Antártica* known to me is the manuscript copy of all three Parts which is in The New York Public Library. It dates, according to Dr. Victor H. Paltsits, from about 1700-1725. From time to time one hears, but only vaguely, of other manuscripts of this work. The original manuscript seems completely to have disappeared. All references to Father Cabello's work hereafter are to the N. Y. P. L. Manuscript.

[20] See P. A. Means, *Ancient Civilizations of the Andes,* 1931, pages 50-55, where Part III, Chapter XVII, of the New York Public Library Manuscript of the *Miscelánea Antártica* is cited, and where sundry other works are cited, also.

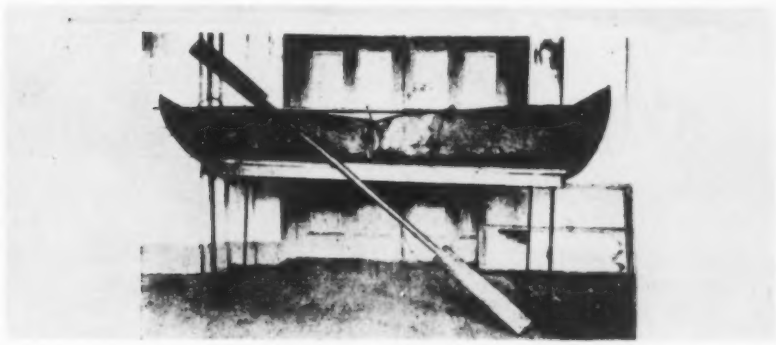
An Early Chimu (or Mochica) pot, from Chimbote, showing two men on an inflated sealskin boat provided with a cockpit

The original is in the Baessler Collection in the Ethnological Museum, Berlin. After Max Schmidt



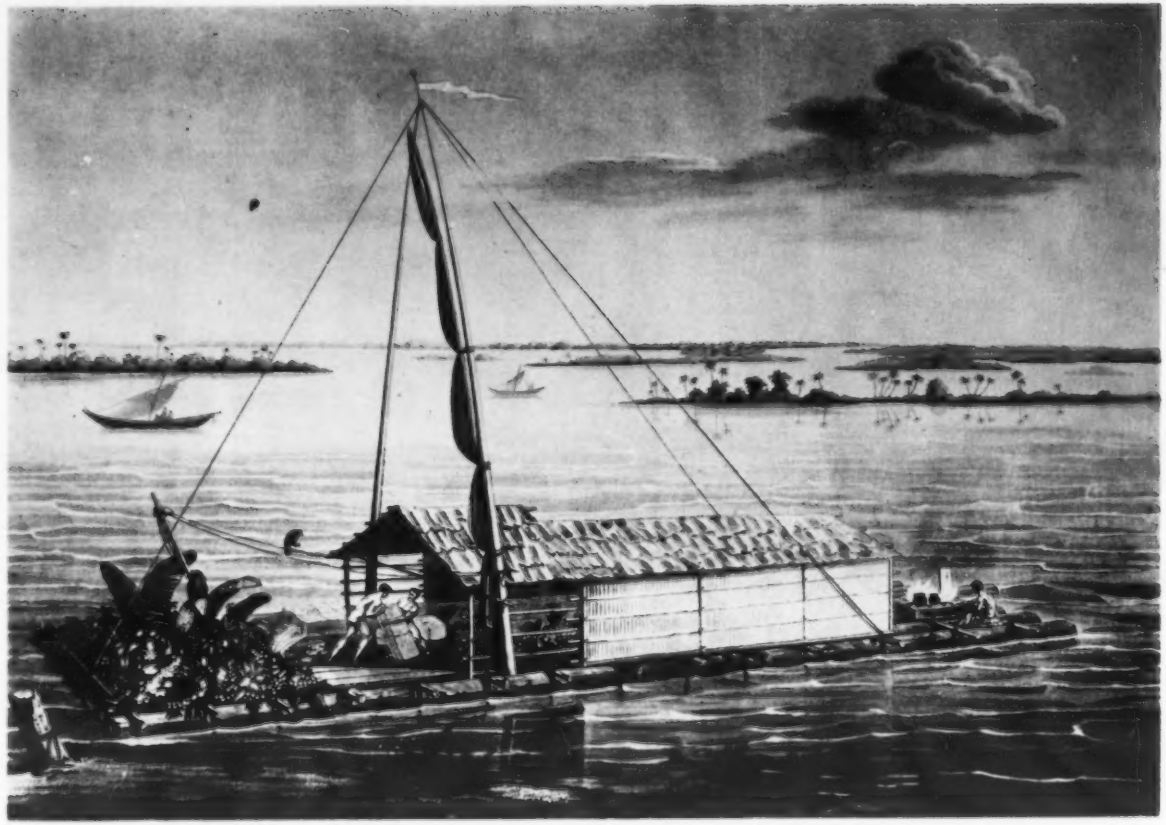
A catamaran-like boat, now in the Museum of the American Indian, Heye Foundation, New York City

After Lothrop



A catamaran-like boat with double-ended paddle, now in the National Museum of Natural History, Santiago de Chile

After Lothrop



An early nineteenth-century engraving of a very elaborate *balsa*-wood raft in the Guayas River
After Humboldt, 1810

not cause it to be published, and eventually a part of the manuscript found its way to the Library of Göttingen University. There, in 1906, Professor Richard Pietschmann brought out a good edition of the Spanish text, and in the next year Sir Clements Markham brought out in London an English translation.[21]

According to Father Cabello de Balboa and Captain Sarmiento de Gamboa, the Inca Tupac Yupanqui, while in the neighborhood of the Gulf of Guayaquil, heard of two islands named Hahua Chumpi and Nina Chumpi which were said to lie some eighty or one hundred leagues to the west. After duly pondering upon the matter and consulting his wise men, the Inca decided to conquer those islands in order to add them to his already enormous empire. So he caused a large fleet of *balsa* rafts to be made and on it he placed a great force of soldiers. With this expeditionary force the Inca sailed westwards and found the islands. On the return, a year later, of the Inca to his own domain, the expedition brought back strange spoils. These were: Black prisoners, gold and silver, a seat of brass, and the hide and jaw of an animal described by both our sources as being like a horse.

In the present connection the chief point about this story is that it indicates that a voyage with a large fleet of *balsa* rafts was made in a westerly direction by the Inca Tupac Yupanqui from the Gulf of Guayaquil region about 1480. Presumably, the *balsas* composing the fleet were of the very best type known to the Incas, that is, craft not unlike those in Figure 5 and Plate 20.

The questions suggested by the story are, however, both many and difficult to answer: Where did the expedition go? The tale implies that islands were reached some one hundred leagues (three hundred miles) to the west where people were found who looked 'black' to the Incas, themselves not blondes but rather of the complexion of other American natives; where animals like horses were known; and where not only gold and silver but also brass were to be had. It is clear enough that there were no islands which fulfill the requirements within some three hundred miles to the west of Guayaquil. The whole problem of where the expedition went should be studied carefully to determine, if possible, whither the Inca's fleet of *balsas* went. Unless we discard the whole story altogether as merely fabulous, an impossibility in view of the two Chronicles which relate it, the fleet must have gone somewhere. Was it only to some

[21] P. Sarmiento de Gamboa, *Geschichte des Inkareiches*, edited by Richard Pietschmann (Berlin: Königlichen Gesellschaft der Wissinschaften zu Göttingen, 1906). *History of the Incas*, translated and edited by Sir Clements Markham (London: The Hakluyt Society, 1907).

off-shore islands such as Gorgona or La Plata? If so, how could it have taken nine months or a year to accomplish, and how can the 'black' prisoners, and the horse-like animals, be explained? Was it, as Sir Clements Markham and others have thought, the Galápagos Islands that the expedition visited? If so, how explain the 'black' men and the horse-like creatures and the brass seat, all being elements wholly alien to those islands? Besides, the Galápagos group lies some six hundred miles west from Ecuador, twice as far as one hundred leagues. Or, finally, did the expedition penetrate the Pacific as far west as some Polynesian group, the Marquesas or others? This seems impossible. Had the Inca got into Polynesia, where the natives have admirable boats, he would have learned how to build better craft than *balsas;* but, according to the story, he returned on the same boats that he went out on.[22]

The first of the three marine incidents found in pre-Spanish Andean history is the early Naymlap migration on a fleet of *balsas*. The second is the Inca Tupac Yupanqui's expedition about 1480, also involving a fleet of *balsas*. The third is, strictly speaking, not pre-Spanish; moreover, it concerns but one *balsa* and the people and things upon it. But, as will appear, the implications are of purely native and pre-Spanish import.

Early in 1527, during the course of the second expedition of Pizarro and Almagro from Panama towards the Inca Empire, one of the two ships of the expedition was proceeding southwards under the command of the Pilot Bartolomé Ruiz de Estrada. At some point a little north of the Equator, off the coast of what is now Ecuador, Ruiz met upon the sea a large *balsa* of some 30 tons burthen. It had a cotton sail, or sails, and some score of men and women passengers besides an impressive cargo including objects of gold and silver and an assortment of miscellaneous merchandise. At the sight of the Spanish ship, which cannot itself have been of more than about 70 tons burthen, some of the men on the *balsa* sought to escape by swimming. Of those who remained on board a few were taken by Ruiz in order to learn about their origin and the source of their rich cargo. Thus he learned that the *balsa* had come out of Tumbez and that it was proceeding up the coast on a trading journey. The descriptions of this *balsa,* of its rig, of its deck-house, of its passengers, and of its cargo given by various Spanish writers within a few years of the incident make it clear enough that the *balsa* was of the most elaborate type known. Moreover, the fact that it was going northwards from Tumbez on a trading journey implies that such enterprises were usual. Finally, as Ruiz

[22] For a discussion of this voyage, see: P. A. Means, *Ancient Civilizations of the Andes*, pp. 270-271 and Note 56 on p. 282. At the latter place various pertinent citations are given.

immediately perceived, the persons on board were far from being mere savages such as those seen on the coast south of Panama; on the contrary, they were obviously the subjects of some great and advanced state down the coast, presumably of that rich realm of which the Spaniards had been hearing vague rumors for some years past. When Ruiz made his report to Pizarro about this *balsa*, it no doubt helped to obliterate the misery and despair which Pizarro and those with him had been experiencing among the jungles and swamps of the coast. If so, the *balsa* was an encouragement to Pizarro to push forward his plans for finding and conquering Peru.[23]

Altogether, we are justified in concluding that, in Peruvian native navigation prior to the Spanish conquest, the *balsa*-log raft, with sails, deck-house, and cargo-space, was the least contemptible and the least inefficient type of craft known. This, admittedly, is faint praise; but, in view of the facts, it is the best that can be given to the boat-building art of those singularly unmarine-minded people, the ancient Andeans. It is well to note in passing that research performed by John Howland Rowe, an able student now in Peru working for the Institute of Andean Research, has revealed the fact that the two general languages of the Andean natives, namely, Quechua and Colla (or Aymará), have between them only one word for boat. It is the word *huampu*, and all terms relating to boats and to parts of boats and to kinds of boats are built up on this one word to which are added, at need, elements indicative of parts of the boat or of use of the boat, etc. Thus, the word for oar or paddle is, literally, 'of-a-boat-paddle.' And so on. This conspicuous lexical poverty, in Quechua and Colla, of terms referring to ships, boats, rafts, etc., etc., is a reflection of the general ineptitude of the people for seamanship as a whole.[24]

The ineptitude of the Andean seaboard dwellers in marine matters is difficult to explain. Their long coastline had a sufficiency of ports and it should have made them expert upon the ocean from which they derived so great a portion of their food. Moreover, at least in the northern part of the Andean coast, wood capable of being used for the building of really good boats was plentiful. Yet the Andeans never developed vessels worthy to be compared with the best types of craft made by sundry Oce-

[23] Accounts of the Ruiz meeting with the large *balsa* out of Tumbez, based on sixteenth-century sources, will be found in: W. H. Prescott, *History of the Conquest of Peru*, Bk. II, Ch. III; P. A. Means, *Fall of the Inca Empire*, pp. 19-20, and note 10 on p. 37; R. C. Murphy, 'The earliest Spanish advances southward from Panama along the west coast of South America,' *The Hispanic American Historical Review*, XXI (1941), 1-28, especially 17-18.

[24] The word *balsa* is neither Quechua nor Colla. It probably comes from one of the local tongues spoken around the Gulf of Guayaquil. Primarily, it indicates the *balsa* tree and its wood, meaning raft only by extension of the original meaning.

anic and Oriental folk who, in terms of general culture, were more or less their equals. Why?

The answer lies, I think, partly in the cultural and geographical isolation of the American native peoples as a whole, and partly in the separation from one another of the American native cultures of varying grades. The first of these factors explains why no stimulus was received from outside America concerned with such elements as the wheel (totally unknown in ancient America) and as advanced shipbuilding. Here we should note in passing that Mr. James Hornell, in seeking to trace the origin of *balsas,* has indicated the occurrence of *balsa*-like craft in the Marquesas and in other parts of Oceania, Asia, and Africa. He concludes that the *balsa* was brought into western South America from eastern Asia by means of coastwise diffusion by way of the Aleutian Islands, Alaska, and the west coast of America.[25] This thesis of a coastwise diffusion of the *balsa* type of craft from eastern Asia and/or Oceania into western South America is vitiated by the fact that the *balsa* type appears along the indicated route only at the extremities thereof, absolutely no traces of it appearing in the immense intervening stretches of the American west coast. It is true that the *balsa*-like craft described and pictured by Mr. Hornell as existing in parts of Oceania, Asia, and Africa do present many striking similarities to the humbler sorts of Andean *balsas,* but these are the products of chance parallels and are not proofs of this diffusionistic thesis.

The second of the factors mentioned above, namely the separation of the American native cultures from one another, explains why such admirable boats as those of Alaska and of the northwest coast of America—not to mention the many kinds of bark canoes of North America, the dugouts of Central America and of the great fluvial regions of South America—never became the basis for a widespread shipbuilding tradition which, in the hands of the high-cultured people of Mexico, Yucatan, and the Andean area, might have become a really advanced marine technique. The highest native American cultures, being shut off from the other high cultures of the world and also from one another and from other and less advanced American cultures, simply never had a good initial stimulus towards boat building, and so they never made any noteworthy progress in that field of endeavor. This, unsatisfactory though it be, is the only explanation I can think of for the lack of marine expertness which the otherwise advanced Andeans displayed in pre-Spanish times.

[25] J. Hornell, 'South American *Balsas:* The Problem of their Origin,' *The Mariners' Mirror,* XVII (1931), 347-355.

The Piscataqua River Gundalow[1]

BY D. FOSTER TAYLOR

THE word 'gundalow' may be found spelled in a wide variety of ways, the most common forms are 'gun'low,' 'gondela,' 'gundalow,' 'gundaloa,' 'gundeloe,' and 'gunlo.' They are all colloquial forms of the word 'gondola.' In New England the word is usually spelled g-u-n-d-a-l-o-w, but commonly pronounced in two syllables—'gun'low.' It has been described as 'a heavy flat-bottomed barge or boat, used especially in parts of New England. In the Revolutionary War these boats were often used as river gunboats.'[2] The word 'gondola' comes from the Mediterranean where it describes the long, narrow, flat-bottomed and high prowed craft used on the Venetian canals for passenger traffic, and general freighting. In other parts of Italy the word describes a six- or eight-oar passage boat employed usually as a ferry-boat for the transportation of passengers, their luggage, and freight.[3]

In this country 'gondola' has been used for years to describe a railroad car fitted with low sides. Apparently, the word always has been associated with the conveyance of people, their property, and public necessities. At any rate, the early colonial settlers adopted this name to describe the flat-bottomed lighters employed in transporting passengers and their belongings over rivers and arms of the sea. The early New England accounts, newspapers, and town histories contain many references to gundalows.

The earliest local record of a boat built and intended for the transportation of freight, and probably passengers, is found in Governor Brad-

[1] In 1936 the Massachusetts branch (District 1) of the Historic American Merchant Marine Survey, W.P.A., under the sponsorship of the Smithsonian Institution of the U. S. National Museum, authorized a study of the Piscataqua River gundalow. A report was made by D. Foster Taylor in February 1937. See Frank A. Taylor, 'The Historic American Merchant Marine Survey,' *The American Neptune*, I (1941), 68. A detailed account of the gundalow *Fanny M.* will appear in a later issue of the *Neptune*.

[2] *Webster's New International Dictionary*.

[3] William Burney, *New Universal Dictionary of the Marine* (London, 1815).

ford's statement, that 'The carpenter [who arrived at Plymouth 1624] is an honest and a very industrious man, quickly builds us two very good and strong shallops, with a great and strong lighter. . . .'[4] The lighter was needed to transport cargoes between the shore and vessels anchored in deep water, since these early settlers did not then possess docking facilities. There is scarcely any doubt that she was flat-bottomed; and in all probability had the ends of a scow.

In John Albee's history of New Castle[5] it is stated 'I have found allusion to gundalows as far back as 1696,' but no reference is given. He does give a later account, wherein a 'gondela' is mentioned; and quotes from the petition, dated 1726, of the towns of Rye and Portsmouth opposing New Castle's wish to throw a bridge across Little Harbor. This petition reads, in part, as follows: 'Another unspeakable hardship which will attend a bridge is ye transportation of hay from ye meadows and marshes where the tides must be attended both by night and day; and to pass under a draw bridge or through any such gap as there may be with a gondela of hay in a dark night and a strong wind or in any other vessel with so strong current as there is besides must be a danger too terrible to be thought on.'

There is a record of a petition made in 1694 by William Furber[6] to the Provincial Council, to establish a ferry at Welshman's Cove, for the transportation of travellers over Oyster River. This is the earliest record I have found where the word 'gondola' or one of its corrupt forms was used. It is indeed curious to notice that this early instance, only seventy-four years after Plymouth was settled, gives almost the correctly spelled form. The petition was granted—'the said Furber to keep attendance and a sufficient boat or gondoloa.' It might well be argued that the name gondola attached itself first to craft employed as 'passage boats' in a service similar to the six- and eight-oar Italian gondolas. John Albee[7] writing in 1884 stated, 'You may decline this word gondola, gondela, gundelow; the first form is pure, the second a variation, the third a corruption. And this order shows also another form of declension in the uses to which the craft was put; first a conveyance for passengers only; second a similar purpose and sometimes also freight; and last nothing but rough cargoes of coal and ballast. Words are corrupted as fast as the thing signified comes to an abased use.'

[4] James Thatcher, *History of the Town of Plymouth* (Boston, 1832), p. 77.
[5] John Albee, *New Castle Historic and Picturesque* (Boston, 1884), pp. 55 *et seq.*
[6] George Wadleigh, *History of Dover, N. H.* (1913), p. 101.
[7] Ibid., footnote 5.

The name 'gundalow' was used only in the New England states of Maine, New Hampshire, and Massachusetts to describe a type originally common to all the colonies. In every other place except New England the lighter, or scow remained practically unchanged. But in this section the form of the craft became as distinctive as its name.

The gundalow was not a fixed type throughout its existence. The craft of the Revolutionary period was entirely different from that of the 1870's, not only in hull but in rig. While the original flat-bottomed square-end lighter developed into the spoon-bow, lateen-rigged craft of the 1870's, it must be remembered that throughout all periods, the first crude form was widely used. The gundalow was given up prior to the turn of the last century, and the few remaining examples, which owed a longer life to sentiment, rotted their timbers away on the mud-banks of the Piscataqua River about 1900. 'The last gundalow out of Durham River, left in August 1889 with a load of bricks for Portsmouth Navy Yard.'[8] As far as I can learn but one gundalow was working after 1900—the *Fanny M.* of Dover, New Hampshire. Her long abandoned hull finally broke up in the ice and disappeared in the spring of 1925. On August 1940 I found the wreck of a small undecked gundalow buried in the muddy bank of the North River, near Marshfield.

The development of the gundalow seems to fall into three periods, though it is impossible to exactly mark them by dates. These periods, or stages of development may be broadly stated as follows:

1. First period—dumb barge or square-end scow, without an attached or permanent rudder, deck, or transom—1650 to 1800. Propulsion was by means of poles and oars.

2. Second period—still a dumb barge, with a square transom, fixed rudder (usually a tiller), short platforms in the ends, cuddy, and occasionally sails. When sails were employed they usually consisted of a single square sail hung on a yard, the mast being removable—1800 to 1860.

3. Final period—a fully decked, spoon-bow vessel with a wheel, lateen sail, and lee-board. It appears the round stern was only used in this later period 1860 to 1900.

One of the most interesting phases of maritime history is a study of the influence exerted upon boats by the peculiar conditions under which they operate. There is no useful appliance of mankind more subject to the influences of trade and natural conditions than watercraft. Ship types

[8] Statement to author by Captain Edward H. Adams, the last gundalow captain on the river.

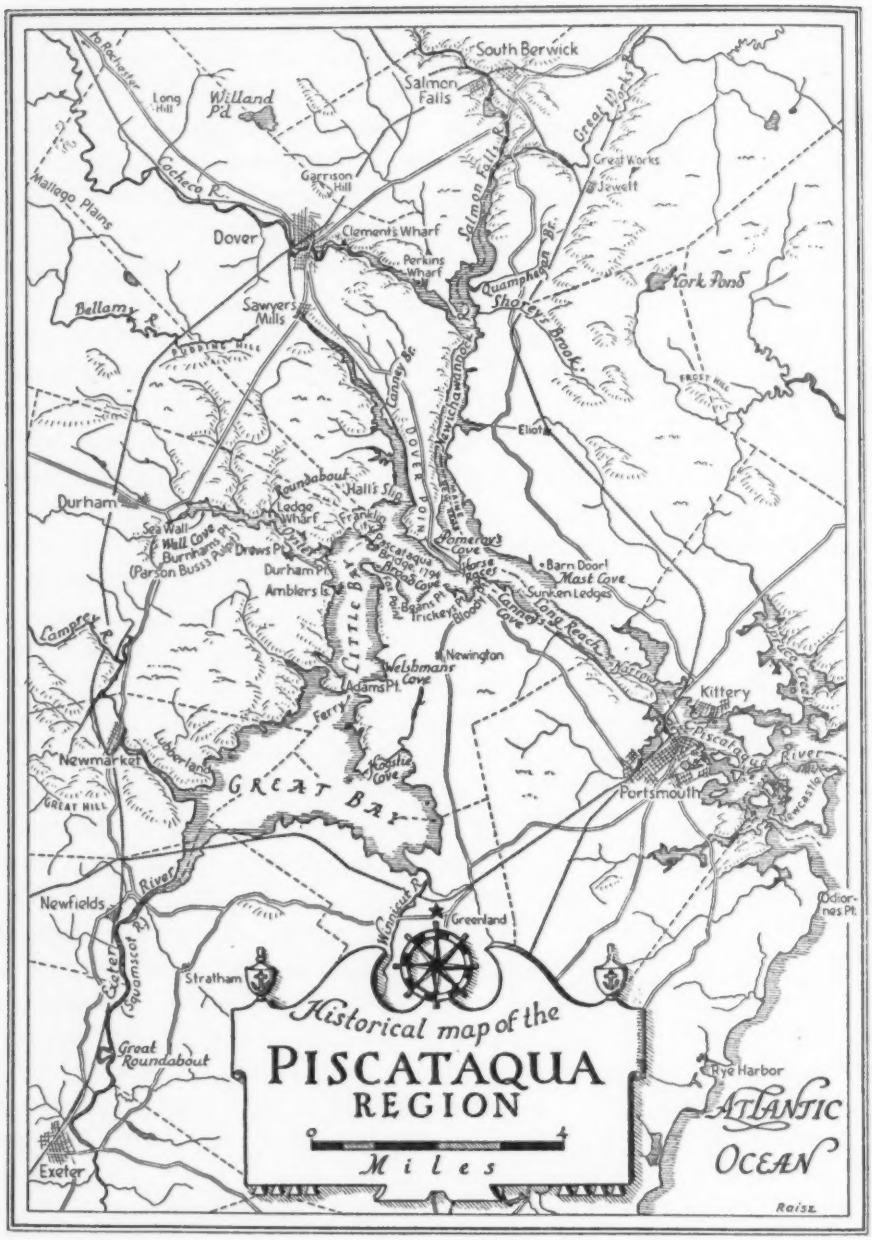


Figure 1

Reproduced from William G. Saltonstall, Ports of Piscataqua *(Cambridge: Harvard University Press,* 1941*) by permission of the author and the publisher*

owe their existence to popular approval. For these reasons the hull and rig of watercraft are rarely stabilized in one form over a long period of time. The primitive types of native boats are known to vary little, but among more enterprising races, constant change and development mark their marine history. Like all watercraft the gundalow existed because of very practical reasons. When conditions changed, and these reasons no longer held, the gundalow faded into the ever growing limbo of ship types along with the frigate, clipper ship and the topsail fishing schooner.

I like to think of the gundalow as a tool of the nation builders. I like to think of it for the service it rendered this little corner of American life. Built and operated by humble people it performed a rough and heavy service, without romance or much reward. Of course, blue water sailors had no time for anyone connected with the 'square toed frigates,' or 'Portsmouth pleasure boats,'[9] as they were often called. One worthy named Captain Johnson Stevens of the schooner *Sally* is quoted as writing 'A Man that would sail a Gundilo would Rob the Church Yard.'[10]

A consideration of the geography and economic problems of northern New England will reveal several factors which greatly influenced the form of watercraft used in this region. Examine a map showing the New England coast north of Boston, and especially notice the area of Portsmouth, New Hampshire. The Piscataqua River region (Fig. 1) might be properly described as the breeding ground of the gundalow for here it reached its highest development. Eastward of Cape Cod the shoreline is deeply indented by bays and rivers, while the island fringed coast of Maine is especially striking. Nowhere along the entire seaboard of the United States will be found a coastal formation so cut up by bays and inlets, and large bodies of tidal water. Hundreds of islands cluster the broken entrances to harbors, while rocky peninsulas, almost islands themselves, form deep bays, some running for miles inland. Consider the fact that the shortest distance between the northeast and southwest extremities of the coast of Maine is only two hundred and twenty-five miles; but due to the indentations and projections, the actual coastline measures more than twenty-five hundred miles. The larger bays form the mouths of Maine's principal rivers which drain most of her large area southerly to the sea. Portions of the coast embracing the

[9] 'Last evening six or seven iron cannon were taken by some of the towns people from near Jno. Timmins' store, and put into a mudscow, or Portsmouth pleasure boat, with a view to carry up Cambridge river by the way of the Mill Pond.' 'Letters of John Andrews, Esq., of Boston,' *Proceedings of the Massachusetts Historical Society*, VIII (1864-65), 364, 386.

[10] William G. Saltonstall, *Ports of Piscataqua* (Cambridge: Harvard University Press, 1941), p. 180.

shoreline of New Hampshire and Massachusetts contain thousands of acres and marshland interlaced by narrow tidal creeks, whose waters reach the sea over shallows of mud and sand. Here the difficulties of transportation and travel by land, in what was a vast wilderness during the colonial period, were probably greater than in any section of the coastal settlements. Roads were simply not in existence. Even in the larger towns of Maine and New Hampshire wheeled vehicles did not make their appearance until much later than in the other colonies. If nature had erected these almost impassable barriers to travel by land, she had provided her 'great medium of communication'[11] to the coastal settlements as well as to great areas in the interior. From almost every point of view the territory of Maine stood apart from her sister New England provinces. Her founding and development, while influenced by forces common to all, was affected by still other conditions than those imposed by nature. One of these influences which greatly retarded the development and settlement of Maine and New Hampshire was the bitter French and Indian Wars. Except for short periods of armed peace the few settlers were in a constant state of defense against a cruel and relentless enemy. Of course, there could be little or no improvement in land transportation where an already difficult problem was aggravated by almost one hundred years of Indian warfare. In no other section of America was the early struggle for economic security more aggressively waged than in New England. Political obstacles from within and without the colonies were many and severe. Burdensome though they were, nothing matched the unending resistance of nature.

Keeping in mind the geographical, social and economic problems of northern New England, the gundalow offered several advantages. In the first place they cost very little to build and practically nothing to maintain. Nearly all farmers near tidewater could and did own one. They were built during the winter of timber from the nearby wood lot. Farming and river boating seemed to go together. With such a boat the farmer maintained contact with the outside world. Needed supplies were brought up from the larger towns near the seacoast, and he was able to take to market his surplus products. One of the most extensive services performed by the farmer's gundalow was the transport of salt marsh hay. Tons of it cut upon the low tidal flats during the fall created such a seasonal demand for gundalows that it was next to impossible to hire one for any other purpose.

[11] Captain A. T. Mahan, 'Possibilities of An Anglo-American Reunion – July 1894,' *North American Review*, November 1894.

In the North River region (south of Boston) grazing grounds were scarce since the settlers needed all their cleared land for other crops. The meadows were of great value to them for cattle forage. Those areas above Little's Bridge were generally accessible to horses equipped with 'meadow shoes,'[12] but on the lower course, gundalows were indispensible. Here the harvesting of hay seems to have been the principal employment of gundalows on this small stream, though they were used to lift newly constructed vessels over the bar at the mouth of the river.[13]

Since one of them, while empty, would float in less than a foot of water, and drew only about four feet heavily loaded, they were ideal for work in shallow places. The bottom of a gundalow's hull, being flat or nearly so, it could lay aground almost anywhere even when fully loaded. The river types of 'pole boats,' 'barges,' or 'keel boats' were used on tideless streams with a current flowing constantly in one direction. The gundalow, however, was able to take advantage of the ebb and flow of the tide. Down to Portsmouth on the ebb tide and back on the flow was the practice when possible. Referring to tides, a gundalow skipper[14] said, 'the tides of the Piscataqua were of special advantage to this type of craft in that ebbing and flowing every six hours it was a decided advantage to have a favorable tide, especially through the bridges that spanned the river. The bridge at Dover Point, now gone, had an especially mean and difficult twist so that when going to Portsmouth "Down one tide and back the next" was the slogan of that day. When the wind failed and the tide favored, the craft could be propelled by means of oars which were always carried alongside, or poled along by means of long slim poles; in this way the trip could be accomplished.' Every spring the gundalow men set out stakes at low tide marking channels across shallow areas. To the top of each marker they secured a piece of white cloth which could be seen more readily at night.

In addition to bridges there were other difficulties no less troublesome for the river boatmen, but happily susceptible to treatment. 'Boiling Rock is off the Eliot shore, and conspicuous at low tide. Beyond are the Narrows. Here is Cutt's Eddy, the worst in the river for boatmen, especially gundalows loaded in old times with wood, from Durham on their way to Portsmouth. Going up Long Reach, the river boatmen, after pass-

[12] Joseph Foster Merritt, *Anecdotes of the North River and South Shore* (Rockland, Mass., 1928), p. 22.

[13] John S. Barry, *A Historical Sketch of the Town of Hanover, Mass.* (Boston: Samuel G. Drake, 1853), p. 156. 'The process of moving large ships was by attaching the scows called gundaloes, (a corruption of gondolas?) two to the stern, and two to the stem; which were lashed down at low water, so as to lift the ship as the tide flowed.'

[14] Letter from Captain Edward H. Adams to author, 19 December 1936.

ing Frank's Fort, used to sing out "Barn Door," as soon as they caught sight of a barn on a distant hill in Eliot, the doors of which were never known to be shut in the season of the river traffic. This was the signal for a "dram" of New England rum, and the men would flat their oars and take their grog, the better (as they thought) to stem the strong current of the Long Reach. The Oyster River boatmen always took another "dram" when they had passed Dover Point and commenced boating up the Horse Races, where the current is very swift and powerful. Another had to be taken at Half-Tide Rock, on entering the mouth of Oyster River.'[15]

In the Piscataqua River region[16] at least several very heavy, if not bulky, commodities were extensively freighted—cord wood, bricks, and timber. Strangely enough this farming community imported large quantities of flour, corn, butter and cheese, indicating its inhabitants were heavily engaged in lumbering, and other allied pursuits. Later soft coal and heavy textile machinery constituted the bulk of the freight in this area.

Keeping in mind the lack of roads, the shallowness of waterways, the other obstructions to navigation, and the relative nearness of the large seacoast city of Portsmouth, the gundalow was the best possible answer to the requirement for cheap transportation of bulky freight. It seems perfectly natural for this type to develop here, for indeed nothing else would quite fill the bill. There is yet another factor which was of great influence on the commerce of southeastern New Hampshire, and, therefore, on the watercraft of this region. Immediately after the War of the American Revolution, the leaders of Boston's commercial life saw clearly that New York was naturally the focal point for the trade of most of southern New England, and that their most likely competitor for trade to the north was Portsmouth. To obtain direct contact with the region of the Merrimac River valley, the Middlesex Canal was dug. 'The bed of the canal was four feet deep and thirty feet wide. It was navigated by boats of twenty-four tons burden, which occupied twelve hours in the average passage through it; and, by means of improvements in the Merrimac, water connection was made as far North as Concord, (New Hampshire), some seventy-five miles from Boston.'[17] This waterway between the two state capitals tapped the trade of New Hampshire west of the Piscataqua area. It did, however, put the Portsmouth business interests on their toes and stimulated water transportation in and out of those localities served

[15] John Scales, *History of Dover, N. H.* (Dover, 1923), I, 221.

[16] See description of this section in Albee, op. cit., p. 55 ff.

[17] Justin Winsor, *Memorial History of Boston* (Boston, 1883), Vol. IV, Chap. V, by Charles Francis Adams, Jr.

by the Piscataqua and its tributaries. The freight boats used on these canals and the Merrimac River are of interest to us because they were gundalows. Their dimensions were limited by the necessity of navigating the canal locks, but their form, and style followed the gundalow pattern. Two excellent pen and ink drawings of these early canal barges or gundalows are reproduced here. The one showing the square sail, clearly pictures a typical undecked gundalow engaged in river freighting. The details of construction in both views are strikingly similar. A description of one will, therefore, suffice for the other. 'The boats were built of two-inch pine plank, spiked on small oak crossjoints and side-knees, and had

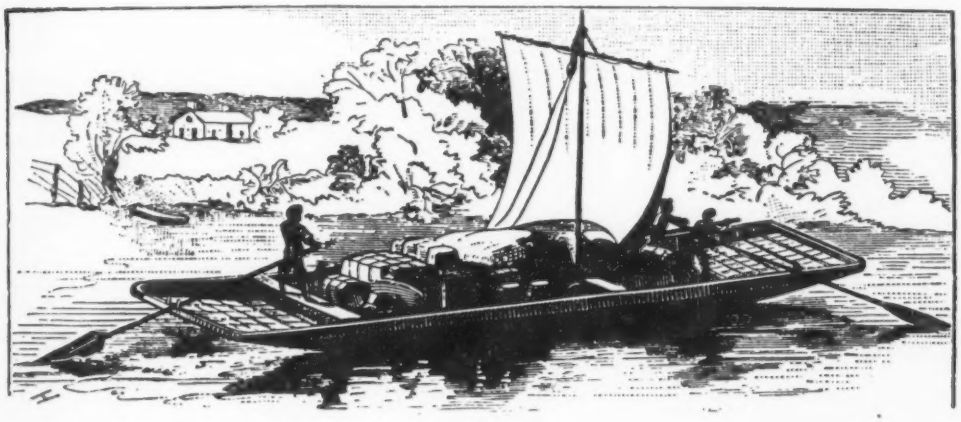


Figure 2

Sailing barge used on Middlesex Canal, Merrimac and Piscataqua rivers for heavy freighting. This type later developed into the gundalow, with the addition of the lateen sail.

From John M. McClintock, History of New Hampshire

heavy oak horizontal timbers at either end. The sides were vertical and without cross thwarts, except what was called the mast-boards—a thick oak plank, securely fastened across on top, from side to side, a little forward of the center of the boat. A cross yard, with a square sail attached, which could be hoisted or lowered at pleasure by a rope working over a single block in the top of the mast, completed the sailing outfit. It was only used upon the river, the mast being struck and stowed in the boat on the larger canals. The rudder was a long steering car, pivoted on the center of the cross-frame of the stern, the blade about eighteen inches wide and ten feet long, trailing in the water behind the boat, and the handle or tiller extending about the same distance over the boat, so as

to afford a good leverage for guiding the unwieldy craft.'[18] It is evident from the cuts (Figs. 2 and 3) and the text just quoted, that these boats were without rudder, lee-boards, or decks, and were nearly alike at both ends. Their bows had little if any shape athwartship, and were almost flat. It will also appear that the ends were different. At first glance one might believe that either end was used as the bow according to the occasion.

Gundalows were frequently rated according to their capacity in cords of wood. 'These seventeenth and eighteenth century gundalows were comparatively small (capacity of ten to twenty cords of wood).'[19] An example is a reference found in the *New Hampshire Gazette* of 25 December 1804—'New 10 cord red Gondola, with stern broken off . . . she has iron clasps round her timber heads.' As a rule, river transportation was largely suspended from November until the latter part of March when the ice went out. The above reference to a gundalow in December may be matched by another statement which indicates river traffic (at least on the Piscataqua River) proceeded during the winter when possible. 'On one occasion there were twenty two-horse pungs at the old Durham Inn with beef from Vermont destined to go down to Portsmouth by packet, provided the ice didn't interfere.'[20]

The lateen rig employed by the gundalow came from the River Nile craft via the lateen mizzens used on the English, French, and Dutch ships so familiar to the seventeenth- and eighteenth-century American colonists. The most striking American example of the use of a lateen sail is found in the rig of some of the Continental frigates. Not only did these vessels carry a lateen sail on the mizzen but one actually carried a lateen sail upon her ensign staff.[21] At the same time, the lateen sail was used on the Lake Champlain galleys[22] and later some of the 'Jeffersonian Gunboats' were likewise equipped with them. During the War of 1812, we have the record of the privateer *General Stark,* schooner rigged, carrying a lateen sail on each of her three masts.[23] It seems certain, therefore, that the lateen sail was well established here.

[18] John M. McClintock, *History of New Hampshire* (1889).

[19] Saltonstall, op. cit., p. 182.

[20] Ibid., p. 188.

[21] G. W. Allen, *A Naval History of the American Revolution* (Boston, 1913), I, 27.

[22] The lake gondolas used during the War of the American Revolution should not be confused with the gundalows because of the similarity in their names. Whatever the gundalow and the lake gondolas had in common, ended there. Howard I. Chapelle in his *History of American Sailing Ships* (New York: W. W. Norton, 1935), p. 54 describes the lake craft — 'This was a flat-bottomed and double-ended [sharp ended] vessel, 40 to 60 feet long, cutter-, sloop- or hoy-rigged. . . . The gondola, as a rule, had neither deadrise nor rocker in her bottom and sometimes had flat sides in sections; at other times the sides had a little curvature. The gondolas all had deep bulwarks and gun-ports.'

[23] William Leavitt, 'An account of the private armed vessels belonging to Salem, Mass. during the War of 1812,' *Essex Institute Historical Collections,* II (1860), 60.

In the Piscataqua River area this sail was first used[24] on an entirely different type of boat—the river packet. These were carvel hull, decked, keel boats, 30 to 40 feet in length, of about 12 to 18 tons in carrying capacity. They carried a lateen sail probably because they could point better in the narrow confines of channels, coupled with the great convenience this rig afforded in passing beneath bridges. The packets were well patronized by passengers and all freight was stowed below deck. By 1860 the packet had practically disappeared.[25] The gundalow adopted the river packet rig during the latter's decline just prior to the Civil War.

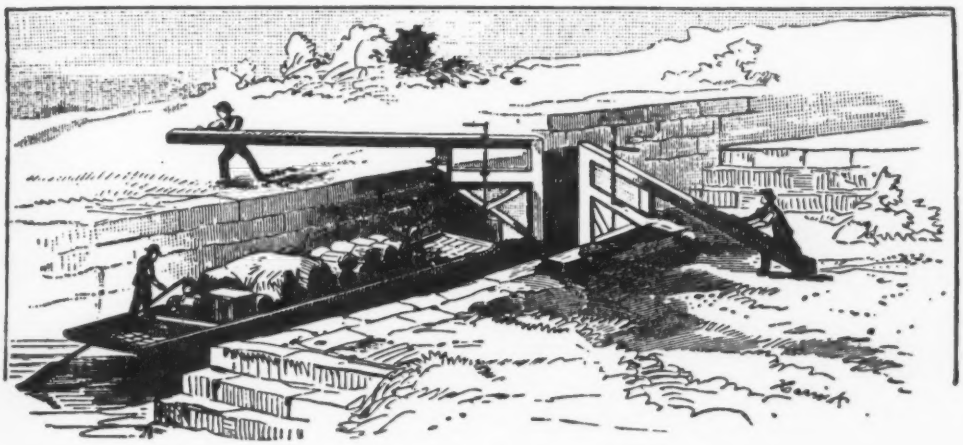


Figure 3

Sailing barge used on Middlesex Canal, Merrimac and Piscataqua rivers for heavy freighting. This type later developed into the gundalow, with the addition of the lateen sail.

From John M. McClintock, History of New Hampshire

Along the Maine coast gundalows were widely used. In discussing the increased prosperity of Kennebunk after the Revolutionary War, Edward E. Bourne[26] wrote 'until the embargo of 1808, such a scene of activity in business was witnessed here as we can anticipate in no future time. The roads were full of heavily loaded teams, and the landing was

[24] About 1800.

[25] The *Gray Eagle* was one of the last on the river, and ended her days about 1870 carrying Jones' Beer from Portsmouth to Dover. Another relic of old river days was the *Factory Girl* employed for years carrying textiles to Portsmouth for the New Market Manufactory Company. This boat's career ended in tragedy. On 30 July 1873, while sailing on Little Bay, a sudden squall struck with unusual violence. The sheet could not be freed in time and the *Factory Girl* capsized, drowning three young women passengers.

[26] Edward E. Bourne, *History of Wells & Kennebunk* (Portland, 1875), pp. 529-530.

crowded with lumber. There were many gondolas in the river [Mousam river], and most of them in full employment.' On the Kennebec River, gundalows were numerous, especially during the 1860's. Most of them were of the plain variety, navigated on tide and current by means of poles and oars to the highest point of navigation, sixty miles upstream. There was, however, an interesting type of gundalow used here employing square sails.[27] The hull had a square stern, perfectly straight flat sides, and a flat bottom. The bow was sharp. It was decked over in the ends leaving the midsection open for cargo. The after end contained a small house, while the fore-deck had a tabernacle which supported the mast. This mast was a single stick carrying a square main and topsail on yards. Through the timbers of the tabernacle and the butt of the mast was a heavy iron bolt. By means of a chain pennant attached to the mast three-quarters of its height above deck and leading forward to the stem head and a pair of stout blocks, the enormously heavy mast, yards and sails could be lowered aft and down into a crotch abaft the cuddy. A windlass of the pump-brake type below the fore deck, but operated from above by longer rods, heaved the heavy spar up and forward until her single shrouds taunted. This method of lowering the rigging in order to pass beneath bridges could not compare with the ease in handling a lateen-rigged boat.

The Kennebec model shows the typical 'barn door' rudder and wheel, and also differs from the Piscataqua species in having two leeboards.

Once the Piscataqua gundalow adopted the lateen rig, it had arrived at the period of its greatest development. Just about that time John W. Griffiths,[28] the great American naval architect, paid tribute to the good qualities of the gundalow and described the type.

> . . . notice the 'Gondolas' used on the Piscataqua River in New Hampshire. These small vessels of but 12 to 16 inches draught when light, and 4½ feet when loaded with 35 gross tons of cargo, are propelled by about 210 yards of sail; they have a small leeboard on each side, and will work to windward and make good headway against the strongest tide-ways of that river, and are often a match for the pleasure-yachts built especially for speed of double their draught of water; they have a length of 60 feet, are 15 feet wide, and 3 feet 8 inches depth of hold in the clear; their rig is that of a sloop, with one short mast about 10 feet above deck, placed within about 5 feet of the bow; the head of the mast has an iron sheave, over which passes a chain. To one end of this chain is suspended a yard of some 60 feet length, or the same length as the vessel, slung within 10 feet of the heel or larger end, which reaches the deck when the yard is peaked and the sail set or brailed; the small end

[27] A rigged model of this type by Mr. James W. Knowles of Augusta, Maine, is now owned by Howard I. Chapelle. Mr. Knowles states the last one he saw on the Kennebec was in 1875.

[28] John W. Griffiths, *The Progressive Ship Builder* (New York, 1875), I, 53.

of the yard is reduced to some 3.5 inches and receives the head or corner of the sail, which in form, is like that of a gaff topsail, or somewhat of a triangular form, the tack being secured to the large end of the yard, while the sheet come to a traveler across the deck near the stern. The object of adopting this rig is to enable them to pass under bridges to which height the length of the mast has been adjusted; by slacking a tackle at the heel or fore end of the yard, the preponderance in weight of the peaked end of yard with the sail upon it brings it down to a level with the masthead, and parallel to the deck, and with this disposition of the sail and yard bridges are passed without inconvenience. This crude apology for a vessel costs, when complete, about $1,500 and we have no hesitation in stating that for river service such as is rendered by these vessels, the same amount of money cannot be invested in another type of vessel which can carry an equal amount of cargo in equal time on the same light draught of water, and pass the bridge obstructions which may be encountered without necessistating the opening of draws.[29]

The North River gundalows have been described by Mr. J. F. Merritt[30] of Norwell, Massachusetts, as

large flat-bottomed boats from 30 to 40 feet long and about 10 to 12 foot beam, sometimes square ended like a scow, and sometimes sharp at the bow like a boat. They drew very little water and would carry from 3 to 8 tons of hay. They were propelled by a pair of long oars or sweeps, near the bow, or by poles, and were steered by an oar over the stern. There was a short deck aft for the use of the steersman and another forward. Some of them were equipped with a sail which sometimes helped along and all of them carried a 20-foot gang plank over which the men poled the hay aboard and which held the boat away from the bank and prevented it getting aground if the tide was running out. . . . A good crew was five men, one to steer and two on each oar, or if it was towing, one man on the bow to fend off and three on the tow line.

Few of us who visit the Piscataqua and Merrimac River areas today can visualize the great volume of business once transacted there. Lumbering, and shipbuilding with all its attendant services were the prime endeavors. The transportation of farm products, and supplies, the carriage of enormous quantities of cord wood, millions of bricks, and the servicing of an extensive blue water commerce, rounded out the chief duties of the humble gundalow.

[29] Griffiths states that gundalows had two lee-boards, but all the information found points to one board only. Captain Edward H. Adams disclaims any knowledge of more than one lee-board.

[30] Joseph Foster Merritt, op. cit., pp. 22-23. According to Mr. Merritt at least two lapstreak boats were built for the transportation of hay, though he does not specifically describe them as gundalows.

The Last Voyage of the Ship Vigilant

To Manila with Coal for Dewey in 1898

CONTRIBUTED BY THOMAS A. STEVENS
WITH AN INTRODUCTORY NOTE BY LINCOLN COLCORD

THE following extracts were taken from the letters to his family of Captain George D. Morrison, master of the ship *Vigilant* on her last voyage to Manila in 1898. Captain Morrison took command of the ship at Norfolk on 21 July 1898. Under the management of E. C. Lawrence, the *Vigilant* had been chartered to William Lamb & Company, who had contracted with the United States Government to deliver a cargo of coal to Admiral Dewey at Manila Bay.

The ship *Vigilant* was built by Nathaniel L. Thompson in Kennebunkport, Maine, in 1877. Of 1,723 tons, her dimensions were, length 224 feet, breadth 40 feet, depth 28 feet. With sharp ends and a beautiful sheer, carrying three skysail yards, she was a particularly handsome model for the period; but throughout her life she was known as a crank vessel, although she was a good cargo carrier. A fast sailer, she was employed almost exclusively in the China trade for twenty-two years, making but two voyages around the Horn to San Francisco in her career. For many years she was commanded by Captain William H. Gould, who died recently at Kennebunkport at the age of ninety-five.

Captain George D. Morrison was born in Canada in 1842. As a young man before the Civil War he served with Captain Samuel Samuels on the famous packet ship *Dreadnaught*. Working up the hard way, he became master of the ships *General McClellan, Friedlander, Frank N. Thayer,* and *James Nesmith*. From the sale of the latter vessel in San Francisco, he came east to take out the *Vigilant* on her last voyage.

Thereafter Captain Morrison had a distinguished career in steam. In 1900 he went through the Strait of Magellan on the chartered British steamship *Asphodel* as a special representative of the newly formed American-Hawaiian Steamship Company, with instructions to lay out the courses for the line and establish anchorages and coaling stations. Later in the same year he took command of their pioneer ship, the *Californian,* going out to Manila via Honolulu and Guam. In successive years he had

the steamship *American* and *Texan,* and was in command of the latter when he died of typhoid fever in 1904. Felix Riesenberg was second officer with Captain Morrison on the *Texan;* in his *Cape Horn* he devotes many pages to the master and his ability as a navigator, giving a chart of Morrison Basin in the Strait of Magellan. Captain Morrison stood at the head of his profession, and was known as an authoritative writer on marine subjects.

The voyage of the *Vigilant,* as described by Captain Morrison, takes on added significance from the course the vessel followed. At the period of the southwest monsoon in the China Sea, all vessels bound outward simply entered the Strait of Sunda between Java and Sumatra, and ran up to their destinations with a favoring wind. But during the northeast monsoon, which was the harder of the two, it was the custom for vessels bound to all ports north of Singapore, after they had run their easting down in the Indian Ocean, to swing off to the eastward of the range of islands in line with Java, along the northwest coast of Australia, entering the Banda Sea preferably through Ombay Pass on the north side of Timor.

Once in the Banda Sea, the course was set northward for the entrance to Pitt's Passage, between Gillolo and Amboina, and thence out through Gillolo Passage into the Pacific. From this position vessels bound to Manila, Hongkong, Amoy and Foochow sailed around the Philippine Islands and entered the China Sea through Ballintang Channel north of Luzon; vessels bound to Shanghai went outside Formosa. The point is that the northeast monsoon swept heavily down the China Sea, but in the Malay Archipelago and among the eastern islands it was broken up, the wind coming from southwest in the daytime and often from northwest at night, with generally light and pleasant weather.

This was the course followed by the *Vigilant;* in nautical parlance it was known as 'going up through the Eastern Passages.' It should be noted also that vessels bound to Japan in the northeast monsoon frequently went all the way around Australia to the south, and up through the Pacific outside New Guinea, passing through the Solomon Islands and the Bismarck Archipelago.

LINCOLN COLCORD

THE VOYAGE

Ship Vigilant. *At Sea,* 19 *August* 1898. *Lat.* 36-29 *N., Long.* 52-06 *W.*

It is ten days since we passed Cape Henry, and it is time I made a beginning on my sea letter. Since sailing from Norfolk we have made 1163

miles, 116 3/10 miles per day. The weather all this time has been exceedingly beautiful with a high barometer and smooth sea.[1] When we passed the Capes only a few of the sails were bent and some of the sailors still drunk, to say nothing of being two men short, which reduces the crew before the mast to fifteen men, four of whom are ordinaries; some of the last know scarcely anything about a ship. Yesterday we overhauled all of the sails and found them in better condition than expected, but after a thorough search we now find the ship to be poorly furnished.

31 *August* 1898. *Lat.* 23-13 *N., Long.* 35-00 *W. Twenty-two days out.*

We are now well within the trades. We took them well to the north, in about 34 N. Lat. Up to that time the wind had been moderate to light breezes from the southward and with very fine weather and smooth seas, all the way from Norfolk. Then it died away calm for a little, the breeze springing up from the eastward; so we came along without much calm. I do not, however, expect a quick passage to the equator at this time of year, especially now that we are twenty-two days out and only in 23-13 N. If we reach the Line in thirty-five days we will do well.

We are all busy, the Mate on deck and I in the cabin. My room has just had its first coat of white paint—a vast improvement, it was such a dingy place. But the sailors! Many don't seem to understand nautical language. The Mate is disgusted and often mad. There are two I think of unsound mind, not bad but simple only.

5 *September* 1898. *Twenty-seven days out.*

Today at noon we were in 13-22 N. and 27-37 W. We lost the northeast trades this morning. Since then we have had light baffling airs from the south, north and west, and a bad cross sea which thumps under the ship's counter in a disagreeable way. At supper time this evening the English ship *Wesdale* gave us his numbers. I see by the Maritime Register that she was in Antwerp July 2nd for San Francisco. There was a bark on our quarter at sunset, and this morning a small schooner passed, bound out. We are now about 180 miles from the Madiera Islands. Devil's darning needles have been about all day.

This will probably be my longest passage to the Equator. We are all anxious to catch rain water. The sailors are dirty enough in person and garments, and besides we are not over stocked with water. This ship bears more evidence of downright neglect on the part of those who fitted her out than any vessel I ever had anything to do with.

[1] This was well within the hurricane season.

11 *September* 1898. 8 P.M. *Sunday.*

It is raining hard and the watch is busy catching water. It is just a week since we lost the northeast trades. Since then we have had variations of the southwest monsoon, with winds from 9 miles to 1 mile per hour. For the most part the weather has been pleasant with intervals of hard rain, which has been a great blessing. Besides the main water tank, which holds 3800 gallons, there are two square iron tanks, each holding 475 gallons. Originally these were common bread tanks and were evidently bought second hand. Last week we filled one of them with rain water after stopping a hole in the bottom. The next morning about half had leaked out.

The Latitude today was 5-32 N. and Longitude 22-13 W., the farthest east I have ever been here. But it is necessary at this season in order to clear the South American coast. I have kept close to the pilot chart tracks and must be near the southeast trades. Today we had divine services on deck. It seemed good once more to read God's word to the men and speak to them of His salvation. They were very attentive, and I hope the seed fell on prepared ground.

18 *September* 1898. *Forty days out.*

Position at noon, Lat. 5-03 S., Long. 29-05 W. We took the southeast trades in 3-41 N. and 20-46 W. last Tuesday, well to the southward. Since then we have made about a southwest course, crossing the Equator Wednesday at midnight 37½ days out. We are now in a good position, being well to windward of Fernando Noronha and the Rocas. Thus far we have not seen any Spaniard prowling around for prey. But we suppose the war is over and no more danger exists from that source. The sailors are a poor lot. Two can't speak English at all; many of them don't know the ropes even yet.

The condition of the ship is worse than the *James Nesmith,* and but little to do with. The carpenter spent two weeks cutting rotten wood from the mainmast head, and put new wood in. Yesterday he commenced cutting and digging rotten wood from the bowsprit. After that is done the foremast requires similar treatment. Some of the yards are more or less so. Mr. Land, the Mate, is a good seaman and watch officer, but he is very ugly to the men. He has an unhappy disposition. The 2nd Mate apparently is a better man. He is married, which makes a difference.

10 *October* 1898. *Lat.* 36-52 *S., Long.* 0-52 *E.*

Looking back I find that I have not written anything for twenty-two

days. Since leaving the trades the weather has been cloudy, gloomy, rainy and squally. We went pretty well north of Tristan da Cunha, passing much kelp which came from them fully 400 miles to the eastward.

The crew are sadly inefficient, but thus far we have gotten along pretty well. The Mate is exceedingly ugly to those not likely to offer much objection. I have checked him several times. He doesn't like it very well, but I have given him to understand that he will not be allowed to make a hell of my ship, and that I am responsible for the conduct of her affairs. The 2nd Mate is a different sort of man, but hard to break of swearing. So far I have sold $370 worth of slops. The men seem entirely destitute. They come aft regularly every Saturday night, and seem to enjoy the purchases.

It is now my thought to run down our easting on the parallel of 39°, rather than farther south, but circumstances may alter this.

23 *October* 1898. *Lat.* 39-55 *S., Long.* 49-44 *E.* 8.30 P.M. *Sunday.*
Seventy-five days out.

Since my last remarks on October 10th we have come a long way and had an experience. We have just passed through a heavy gale beginning at N. by E. and hauling to the N.W. At midnight Friday we began shortening sail, and didn't stop till 7 A.M., when she was hove to under the three lower topsails heading east, with furious squalls and an awfully bad sea. It was more on account of the sea than anything else that I hove to; I was fearful of overstraining the ship in going too fast through the water and causing her to leak, which she does too much already. I judge this is mostly in the topsides, for in fine weather she doesn't leak much. When she settles her stern, there is considerable water coming in through the rudder casing. We lay to for nine hours, when we squared away on our course at 4 P.M. As I write there is a strong breeze from the westward, and the main skysail is set.

6 *November* 1898. *Lat.* 34-33 *S., Long.* 105-37 *E.*
About 453 *miles from Cape Leewin, Australia.*

Just now and for several days we have been doing what may be called some pretty sailing—what everybody would enjoy—fresh fair winds, smooth seas and fine weather. The health of the crew is fairly good. The 2nd Mate and one man have boils, and the sailmaker, named Johnson, has trouble at the pit of his stomach. We have plenty of water. The potatoes are all gone—have been for some time. There were only 10 barrels, the regulation allowance for this ship. Not having any fresh meat, the

men haven't had a fresh mess since leaving. It's too bad—it's dirty mean, but I can't help it. I think the leak in the stern-post about the rudder casing was known by the captain before the ship left New York. Yes, and when she arrived in Norfolk, for that matter, but nothing was said about it. The ship is now pumped every four hours.

The Mate of late has been much more agreeable, since the morning I used some very plain language to him at the breakfast table. It was the morning the mainsail blew away, the heaviest gale we have had. His manners became unendurable, and I concluded to stand it no longer. I don't think him a bad man by any means. He is nervous and made worse by excessive smoking. But he, like many more, had to learn that a man is not necessarily a fool because he fears God. I think him above the average of mates in these days, as to ability. The 2nd Mate is different; he often sings at night while on watch, which the Mate does not.

I almost forgot to mention that on October 30th we sighted St. Paul Island at 7 P.M. I had been steering directly for it; but the weather becoming thick and rainy, I hauled off to the northward of it. The current there sets north-eastward, and I wished to be on the safe side. After sunset the weather cleared off sufficiently to give us a sight of the outline of the island bearing S.W. from us about ten miles distant, we having passed it in the meanwhile. The chronometer (Captain Bailey's) is about 1 mile 38 seconds, in error, 24½ minutes of longitude or about 19 nautical miles. There seems to be a tendency in high latitudes to thick weather about islands, though far separated from the continents, that requires some caution in approaching them.

13 *November* 1898. *Lat.* 18-46 *S., Long.* 113-17 *E.*

Ninety-six days at sea, twenty-eight and a half days from the Cape. Considering all things we have done well. The Lord has been good to us indeed. We are now past Australia; a good delegation of small house flies came off to us in the strong winds that blew. We passed within about 60 miles off the coast. The nearest point to us was Cape Inscription on Dirk Hirtog's Island. I would like to have sighted the land, but the wind was about W.N.W. and we were barely laying our course; and besides I was afraid that nearer to shore the winds might be light. Since nearing Australia the weather has been fine with smooth seas. On Saturday the wind was south, so strong that we had to furl the skysail. The sea became rough and the ship began to leak again, about a 15 minute spell every two hours. When the sea is rough we can hear it running in

about the stern post. I suppose the rudder will require unhanging to get at the leak; and that can only be done in port.

I am rather surprised to learn from Findlay's Directory that there are Protestant Christians on the islands in the Banda Sea. The health of the crew is good. Not only are the potatoes gone long ago, but now the rice is nearly gone. Fifty pounds came aboard in New York! I think there has been the most consummate meanness in fitting out this ship that I have ever heard of. I am often provoked to find so much to do and so little to do with.

23 *November* 1898. *Lat.* 10-30 *S., Long.* 120-30 *E.*

The stretch from Australia to our present position has been rather tedious. The weather has been extremely beautiful with smooth seas, but the wind as usual hereabouts have been very light. For the last few days we have experienced adverse currents. However, after a squally day yesterday we sighted just before sunset Sandlewood Island, sometimes called Sumba Island. The wind fell light, then calm. We then had thunder, lightning and rain, with a remarkably beautiful sunset to follow, after which a gentle fair wind sprang up, with the moon shining, and under a clear sky we had a night of gentle sailing. At daylight Sandlewood Island afforded us a fine view of very high land.

There were trees up to the tops of the mountains, but though we passed at noon within 11 miles of Cape Blackwood we saw no sign of man. Fly Island is high and rugged, with precipitous cliffs. I had a good observation to verify the chronometers. I found Captain Bailey's out 21½ minutes, and the ship's, a poor hack watch, 1 degree and 23 minutes of longitude. Before sighting land I had taken some lunars, which made Bailey's chronometer fast 23 minutes; I was only out 1½ minutes.

We are now 106 days out. If we can get through Ombay Pass in 110 days we will do well. From former log books I find that this ship has been through Ombay many times. We will then be in the Banda Sea, where all the nutmegs grow.

24 *November* 1898.

We are going along 3 to 4 knots with a tranquil sea, which makes delightful sailing. Yesterday morning while passing Sandlewood Island the wind suddenly drew off the land, bringing the most welcome odor. It was delightful after smelling salt water so long. We see butterflies, devil's darning needles, and the old familiar frigate bird, (what sailor's call the marlinspike bird) with its peculiar cry. It is now 4 P.M., the wind is

dead aft and the sea so smooth that we are not conscious of any motion. The weather is beautiful—and it is Thanksgiving. There being no fresh meat on board, I had the steward take enough cabin stores to give the men for the first time on the passage a fresh meal. It is too bad—doesn't look nice for an American ship to be so detestably fitted out that she cannot remember this day in better shape. I think her owners are faring all right, however.

This morning at sunrise we saw the mountains on Flores, a great distance. Mt. Romba, 9187 feet high, was 78 miles away. A little to the west of this was Mt. Roka, also conical shaped, 6562 feet high; this was 81 miles distant. At the same time Sava Island, off to starboard, was in sight 37 miles away. We also saw a flat-topped mountain on Flores, east of the above mentioned, 74 miles distant, and Mt. Lamarap on Lomblen Island, the island next east of Flores, 60 miles away. The great island of Timor, with very high mountains and trees to the summits, was also in sight far to starboard.

This is the time of year when the monsoon blows from northwest in this region. Generally the weather has been fine; the wind is very light at night and hauls to the northward, but during the day it hauls to the south-westward, when squalls make up over the land accompanied by thunder and very vivid lightning. These squalls sometimes reach off to us, but thus far without strong wind. When the evening is advanced the weather improves, giving us fine mornings and beautiful sailing.

28 *November* 1898. *Lat.* 6-14 *S., Long.* 125-28 *E. Monday. In the Banda Sea.*

Yesterday morning just as it was breaking day we passed around the southeast point of Ombay Island in a squall of wind and rain, that so obscured the land it was impossible to accurately estimate the distance. Eastward from Ombay Island is Kambing Island, distant 17 miles. Between these two is the passage into the Banda Sea.

After sunrise the weather improved with a gentle breeze from the southwest, which hauled westward and died away calm, leaving us about 2 or 3 miles from shore with a fine close-hand view. The land is mountainous but trees grow to the very top, clearly outlined against the sky. On the mountain side we saw many villages, some up near the summit. The buildings were quite respectable, some of them gabled cottages. There were scattered dwellings or huts near the beach; with the glasses we could see people walking there, and cocoanut trees along the shore.

About 9.50 A.M. a boat loaded with natives started off. We could hear their peculiar song as they rowed their crazy boat. At 10.30 they came

alongside, fifteen in number, of different ages and naked except for the usual breech-cloth. They flew at the stern a small Dutch flag. They were the usual color of the people of these islands, but did not seem a pure race; their hair, cut short, was neither straight nor frizzled, but between the two.

Their boat had a good deal of water in it. They brought off for sale or barter three pigs, (one very small) of a decidedly Oriental type; a rooster and a few small chickens, too small even for broilers; green cocoanuts; eight pullet eggs carefully packed in cotton; and two yams. These were hauled on deck, aft by the wheel house. I allowed about five of them on board, but it was impossible to do any trading with them; the value they placed on their goods was too high. I offered a coat for a pig that may have weighed twenty pounds, then two new coats. They wanted a barrel of 'biskeet' in addition—the only word of English they knew. I gave three sheath knives for the pullets eggs and the two yams, but the mild-mannered old chief put it over on us in great shape. Not one of the eggs could be eaten, and the yams were tasteless watery things. A sailor gave a suit of oilskins for the rooster, and he has been crowing for us ever since. A breeze springing up, the natives then put for the shore.

This breeze enabled us to make a north course into the Banda Sea. The night was windy and squally; we blew away two jibs and split an upper topsail in a heavy squall the next morning. That day we made 131 miles, yesterday 111 miles. This morning we sighted Boeroe Island, 84 miles distant. It is 8500 feet high, the highest of all the Molucca Islands. I must now take the observation for the Government.

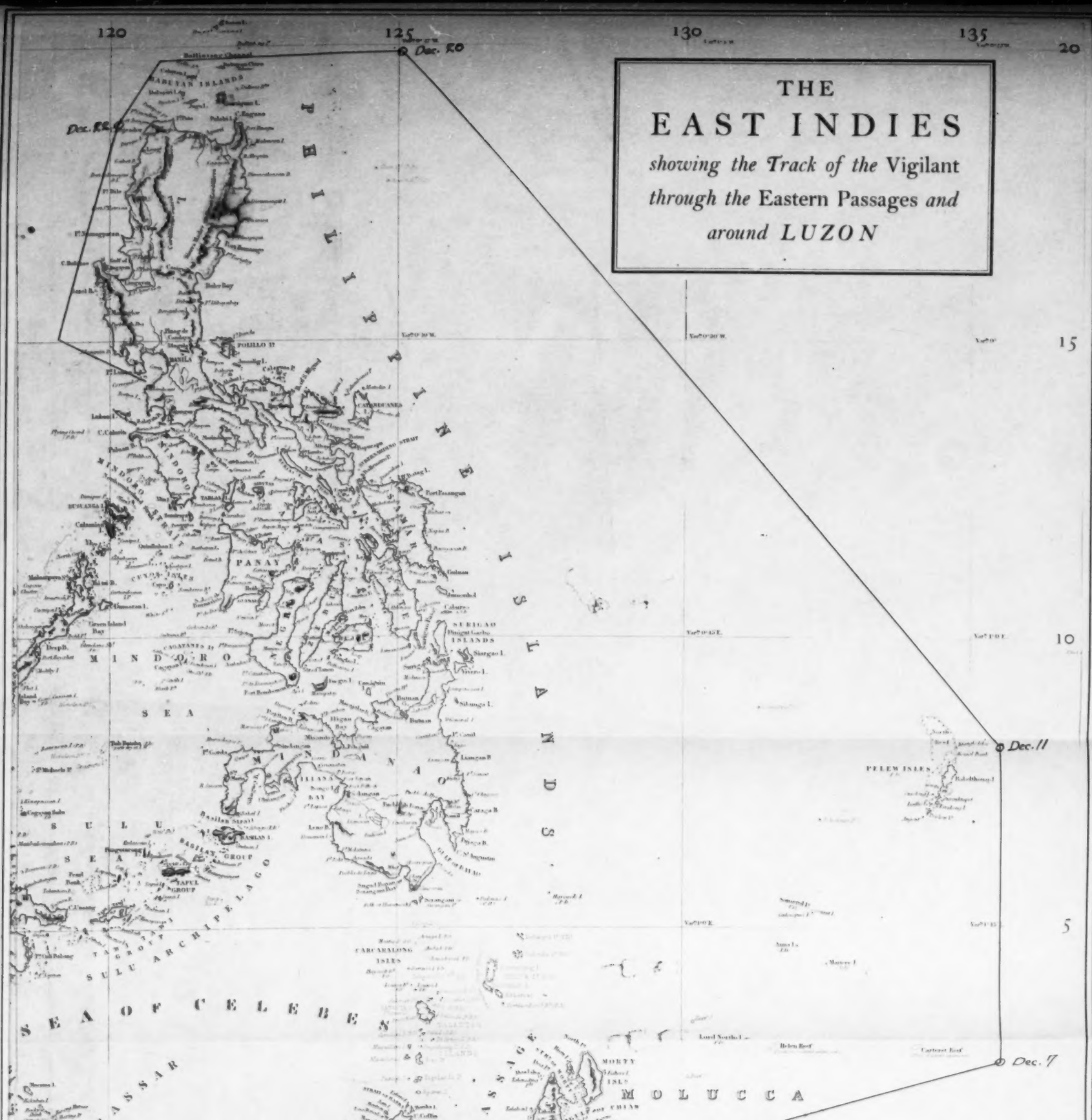
30 *November* 1898. *Wednesday.*

During the last twenty-four hours our progress has been slow, only 25 miles; so that at noon today we were 64 miles from Mt. Tomahoe on Boeroe Island. It seems as far away as yesterday. The weather has been very fine, though hot and sultry. The sea is tranquil, at times a dead sea, when the sails hang motionless from the yards and the ocean looks like glass.

4 *December* 1898. *Sunday,* 7 P.M.

I have been negligent in writing. I should have jotted down something each day, during this extremely interesting part of our passage; but as you can well imagine, the care of the ship in the close and somewhat intricate navigation has fully occupied my time.

Thursday, December 1st, we passed Cape Palpettao, the northwest point of Boeroe Island, and entered Pitt's Passage coming from the


THE
EAST INDIES
showing the Track of the Vigilant
through the Eastern Passages and
around LUZON
120
125
130
135
20
15
10
5
Dec. 20
Dec. 22
Dec. 11
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PHILIPPINE ISLANDS
SEA OF CELEBES
MOLUCCA
PANAY
MINDORO
SULU ARCHIPELAGO
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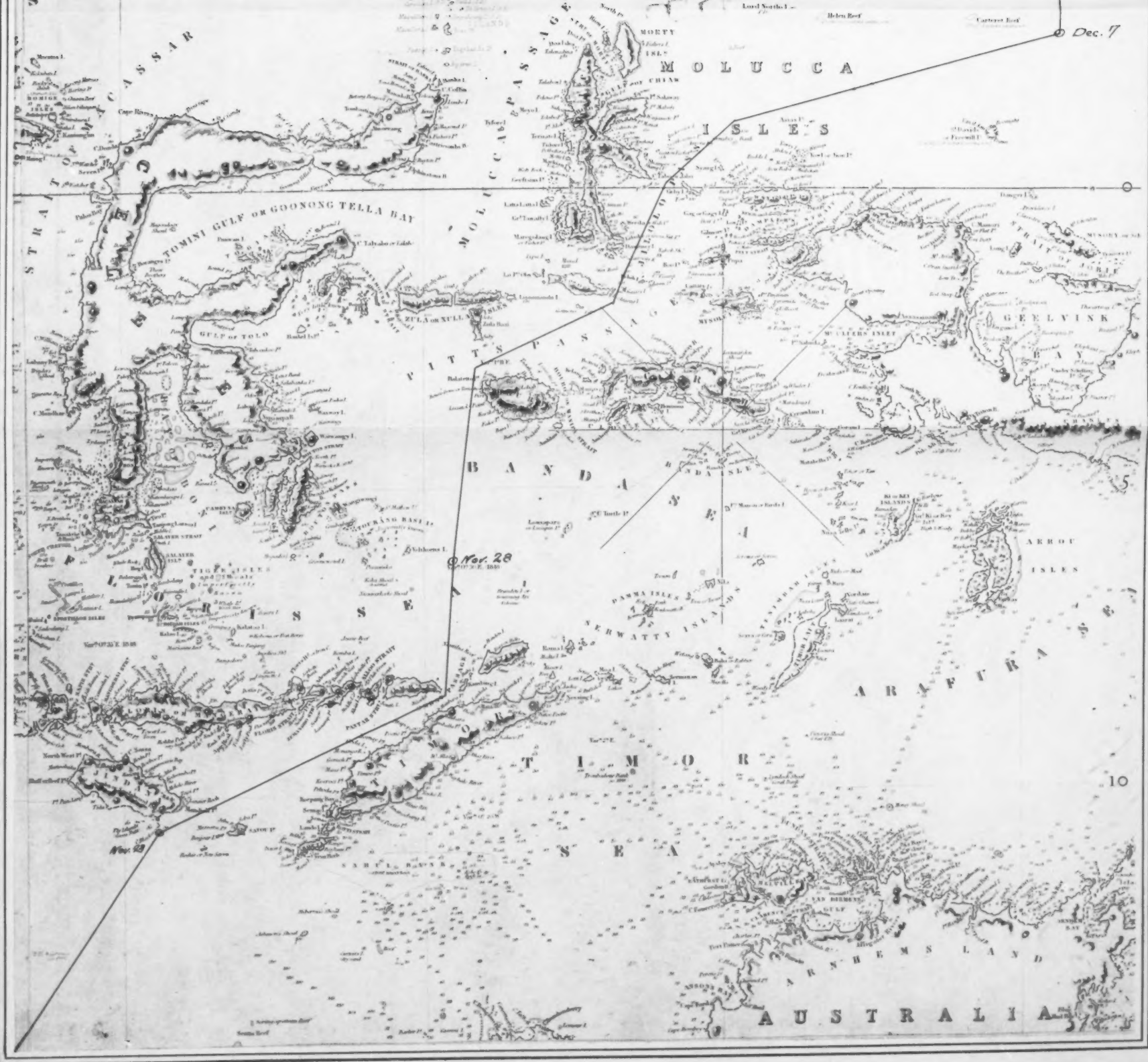

MOLUCCA
ISLES
STRAIT OF CASSAR
MOLUCCA PASSAGE
TOMINI GULF OR GOONONG TELLA BAY
GULF OF TOLO
ZULA OR XULLA ISLANDS
PITTS PASSAGE
GEELVINK BAY
BANDA SEA
ARAFURA SEA
TIMOR SEA
TIMOR
AUSTRALIA
ARNHEMS LAND
AROU ISLES
SERWATTY ISLANDS
Dec. 7
Nov. 28
Nov. 23
10

Molucca Sea. During the forenoon it rained in torrents, with the wind S.S.W., a brisk breeze. We caught a great quantity of water, putting 500 gallons in the main tank. It was pure, sweet and cool as it came down to our hot surroundings—a refreshing drink.

Mount Tomahoe, 8500 feet in height, was so covered with heavy rain clouds that, to our regret, we could not get a full view of it. During the night we had a light breeze, and the next day found a current of nearly two knots helping us on our way. We sailed slowly, but the land receded fast. Towards sunset we saw the smoke of a steamer bound south, I suppose for Timor. That night it breezed up from the S.S.W., and at midnight we passed the island of Gomomo, lying south of the island of Ombirah; at sunrise we were close in to the latter, coasting along three miles from shore. Just to the eastward of Ombirah and close to it lies Lokisong Island (Landscape Island), between which and Gasses Island, nine miles to the eastward, we passed into Gillolo Passage or the Kalmierheri Sea, leading into the Pacific.

The morning was clear and beautiful, affording a fine view of the shore. The vegetation was luxuriant, trees and shrubs growing from the water's edge to the top of the land; Lokisong is rather low, but Ombirah rises to 5000 feet in some parts. The breeze freshened, so that by evening we were through the most difficult part of the Passage. That was yesterday. This morning found us nearing the northern entrance of Gillolo, which is 21 miles wide between Cape Tabo on Gillolo Island and the island of Gaby. By noon we were out in the Pacific Ocean, just one week since our trading episode with the inhabitants of Ombay Island, and eleven days since we passed Sandlewood Island, the entrance to the Eastern Passages to China.

I am well satisfied. We have made good time, and the experience has been interesting and valuable. Before putting down the pen, I must mention the goodness of God towards us. Truly He has led us all the way. Perhaps I should mention that we have been further blessed with good moonlight in coming through the passages.

7 December 1898. *Lat.* 2-37 *N., Long.* 135-36 *E.*

We are now three days from Gillolo Passage and have run up all the easting we care to make; are steering north to pass to the eastward of the Pelew Islands. Though we have made good time from Gillolo we have had a lot of bad weather—thunder and lightning, squalls and torrents of rain. These are what would be called in the Atlantic the 'doldrums,' here they are called the northwest monsoon.

Today we had a sharp squall with a deluge of rain, in which the mizzen topgallant sail blew to pieces and the upper main topsail yard broke in two, tearing the topsail badly. We lost these things not because of so much wind as rottenness in sails and yard. This afternoon we got the yard on deck, no small job. When nearly down, a knot in the lowering-fall slipped and the yard fell on the main bitts, breaking them badly and injuring two of the Mate's fingers. It was a mercy that no one was killed. From where we are now, this ship once went into Hong Kong in 17 days. If we can reach Manila in that time we will do well.

11 *December* 1898. *Lat.* 8-08 *N., Long.* 135-31 *E.*

We are just one week from Gillolo Passage and 124 days out. It is a relief to get north out of the thunder, lightning, squalls and rain. On Thursday last we sent aloft another topsail yard; it was a heavy heave but we got it up without accident. The topsail that was torn has been repaired, and is now doing duty forward. We have passed up east of the Pelew Islands; our course is now more to the westward for Ballintang Channel, through which we pass into the China Sea. At noon today one of the northernmost of the Pelews was 50 miles distant to port, and the island of Goulon on our starboard hand 115 miles distant. We now have the northeast trades but they are very light, the ship making about three knots. The Mate's fingers are doing well.

20 *December* 1898. *Lat.* 19-56 *N., Long.* 125-15 *E.*

The evening on deck is fine, the moon shining in her first quarter. Since I last wrote the weather generally has been squally, rainy and windy. The northeast monsoon has been strong, with a heavy head sea causing the ship to pitch and tumble about. Today we are 165 miles from Ballintang Island, lying in the fairway of Ballintang Channel. I hope to see the island tomorrow morning, as it is visible 27 miles off. This will make 133 days out, and leave us about 360 miles to Manila Bay. For several days we have come along in a leisurely fashion, owing to a rotten main topmast head; I was afraid to carry sail lest it go over the side. Today we sent up a portion of the old topsail yard to support it; now I think it will answer until we see Bro. Dewey. The ship has been leaking a good deal during the heavy head seas.

22 *December* 1898. *Lat.* 18-40 *N., Long.* 120-09 *E.*

Last evening we passed through Ballintang Channel from the Pacific into the China Sea; we are now running down the west coast of Luzon

before a fresh gale of wind from the N.E., with a very high sea running. It is now nearly 5 P.M., and the ship has been going 10 to 12 knots since daylight this morning. The wind appears the regular monsoon increased to a gale; barometer 30.10 and weather fine. I look for it to moderate at sunset. We can scarcely expect to carry this breeze far south on Luzon.

23 *December* 1898.

At noon today we were 130 miles from Corregidor Island. The gale moderated this morning; during the time we had it, singularly enough, a current set us northwest 48 miles. This places us farther off from Luzon than I wished. At 9 A.M. today I hauled the ship up to see the land, when she did some tremendous rolling, plunging, throwing water and shipping seas. I feared for our rotten main topmast, but the repairs stood firm. Now as I write, how different things are! It is a beautiful, serene moonlight night with a smooth sea and a gentle breeze from N. by E., for we have run in under the land out of the seas in the offing. Then there is the welcome smell of the land, where people are burning brush. I am not trusting to finding lights. They may be maintained by our Government, if it has possession. We have no certain knowledge of any kind of land news. With this breeze we expect to be at Corregidor at daylight in the morning.

24 *December* 1898. 5.30 A.M.

I have just a minute or so to write. We are coasting along from Subig Bay to Corregidor Island close under the land, with a very strong breeze from N.E. by E. and clear fine weather. It is just coming daylight, and the land—now ours, I trust—and the brightening eastern sky is grand to behold. Corregidor Light is flashing white and red every ten seconds, about 25 miles off. It blows off the land so strong that we are shortened down to topsails.

25 *December* 1898. *Christmas Day.*

Yesterday we had a hard beat of it to get up as far as Corregidor Island at 5.30 P.M., the wind blowing hard all day from northeast, the regular monsoon. Not caring to beat in the narrow channel during the night, we lay to till daylight, drifting back only 8 miles in twelve hours. Bright and early this morning we started in for a dead beat of it. The Lord was good to us, so that by 1 P.M. we were through the narrow part of the channel. The ship worked to windward very well. We are now heading for Cavite, about 10 miles off, where in the absence of instructions I intend to anchor.

This afternoon at 2.15 we were startled to see smoke coming out of the fore hatch. After examination we concluded that the cargo is on fire in the lower hold; but were utterly unable to locate it or do anything about it. I trust that it is not serious.

26 *December* 1898. *Cavite, P. I. Monday,* 9 A.M.

We came to anchor at Cavite at 7 A.M. amongst the men-of-war and merchant shipping. An aide from the Admiral called on me on business. I am expecting very soon to call on the Admiral with my papers. From his ship I go to Manila 7 miles away, to report my arrival. The smoke is dense in the ship's hold so that we cannot go down, but we will begin discharging tomorrow and I do not apprehend anything serious.

30 *December* 1898. *Cavite, Philippines.*

When I returned to the ship from Manila, the fire had developed with great rapidity. Smoke was issuing from the hatches in dense volumes, the Mate having taken the hatches off to get material up for discharging. The Admiral [Dewey] sent a messenger on board tendering the services of the fleet. The bell rang for fire loud and long. Men from the ships quickly responded with draw-buckets, etc., and we proceeded to throw water down the pump well to flood the ship. I had holes bored through the sides opposite the seat of the fire, and the hatches were again put on. Decks and cabin were filled with smoke. The fire was gaining and the ship was a scene of noise and confusion, but the great thing was to get water into her bottom.

At 8 P.M. the Admiral [Dewey] sent the steam tug *Zafiro* alongside with the largest force pump at his disposal, as well as a smaller tug. The *Zafiro* pumped all night, until there were 6 feet of water in the ship. Then she stopped pumping and intended to leave, fearful that the mainmast would go by the board and smash her. In a few minutes the flames appeared through the ventilator at the main pumps. Something else had to be done.

So the *Zafiro* resumed pumping, but only managed to keep the fire in abeyance. Admiral Dewey sent on board to ask if he could do anything more. I replied that the thing to do was to cut a hole in the ship, but that I had no means or device for doing it. He suggested my seeing the agent of the Hong Kong and Whampoa Dock Company, to secure if possible their 6 inch centrifugal pump. The Captain of the monitor *Monterey,* Zeitser, who had been on board most of the night, took me in a government launch to the agent. Through the good offices of Admiral Dewey I

quickly made the arrangements, and they began pumping water into the ship at noon. At 3.15 they had pumped in 1000 tons, the water in the hold then being 8 feet 6 inches from the main deck. The fire was extinguished, though steam and smoke came up still.

At 9.30 A.M. on the 27th Admiral Dewey made a friendly call, expressing his sympathy with our misfortune. We conversed a few minutes about things connected with the ship and the war. He invited me to come on board the flagship. This is a great honor and I appreciate it fully. He told me during our short conversation that if he had had 5000 troops on the first day of May, he could have taken Manila and held it. I also had the pleasure of meeting at Manila the noted Consul, Mr. Williams, who accompanied the fleet from China here; and who was on the bridge with Admiral Dewey during that great fight of May 1st, which will require a new geography to be made.

I am waiting for the captain of the tug *Powerful* of the Hong Kong and Whampoa Dock Company to call for me to go to Manila. Admiral Montojo's flagship lies a short distance from us, and the bones of many others are lying about the bay. The Spanish warship *Austria* has been raised and will shortly go to Hong Kong to be fitted up more as a trophy than anything else. Two others have already gone to Hong Kong. Consul Williams told us the story of the ever memorable first of May. He described in his admirable way the order of battle—annihilation within one short hour of the whole Spanish fleet consisting of twelve ships, while we had six.

The *Vigilant* has been pumped out, and we are now ready to discharge. But Admiral Dewey has sent me notice that, acting under instructions from the Navy Department at Washington, he could not accept the cargo on the ground of its being wet and unfit for use. He had received about 15 tons, then stopped and cabled Washington for instructions. I immediately cabled my owners, 'Washington instructs Dewey refuse cargo.' This will make a three-cornered fight between Mr. Lawrence, William Lamb & Company, and our Government. I will be interested to see how they come out.

Captain Morrison remained at Manila until June 1899, settling the affairs of the ship with difficulty. The *Vigilant* was finally condemned, on a survey held 16 May, and advertised to be sold at auction on 31 May. She was purchased by Ynchausti & Company for 10,840 Mexican dollars, or 5,420 gold. Captain Morrison sailed from Manila 12 June on board the U. S. S. transport *Hancock,* bound for San Francisco.

Fur Seal Hunting in the South Atlantic

BY A. ALFRED MATTSSON

FUR sealing, as I knew it, was carried on from the west coast until about the year 1900. I had no part in the west coast sealing, but the hunting there led to the discovery of fur seals in South American waters in the following manner.

The great seal rookery on the Pribylov Islands in the Bering Sea came to the United States with the purchase of Alaska in 1867. At that time an estimated herd of seals, numbering 2,500,000, used to find their way to the rookery during mating season (June to September). To protect the herd and preserve the yearly increase, the government decided to follow the course the Russian government had used, which was to lease the rookery to responsible parties who would take mostly unproductive seals (young bulls and batchelor seals).

The rookery was leased to the Alaska Commercial Company from 1870 to 1890 for an annual rental of $55,000, plus a royalty of $2.62 for each skin taken. In the twenty years 1,977,377 skins were taken, paying the United States government $6,020,152, almost the cost of Alaska, which was $7,200,000 in gold.

But that was by no means the total number of seals taken from the herd. A number of vessels were engaged in Pelagic sealing, that is, hunting in open water, and were making raids on the rookery whenever chance offered a safe getaway. I don't know when shotguns were first used in seal hunting, maybe in the late seventies or early eighties, but in 1886 the United States closed the Bering Sea to all vessels using shotguns to hunt seals. A number of vessels which ventured in there were seized and confiscated and the resulting claims finally brought about a meeting between the four nations concerned—the United States, Canada, Russia, and Japan—to settle the matter.

The tribunal was held in Paris in 1893. The United States, as owner of the rookery, claimed that since the seal herd returned every year to the rookery it was domesticated and not a herd of wild animals, and

therefore our government had the right to close the Bering Sea for their protection. The other three nations claimed freedom of the seas, but did concede ownership rights and agreed upon a closed zone of sixty-mile radius around the rookery, and so the matter was settled.

The following year, 1894, was a banner year for open water sealing, the combined fleets taking a catch of 140,000 skins. The demand for seal-skins was great and the fleet of vessels sailing out of Victoria, British Columbia, needed more men and ships to carry on the business. Some of the skippers were sent east to Nova Scotia in off season to pick up fishing schooners and sail them around the Horn to Victoria, British Columbia. These vessels discovered fur seals along the South American coast from the River Plate down to the Horn.

I don't know how many vessels were sent around to Victoria, perhaps five or six. They surely had old sealers on board, as ordinary seafaring men would not know the difference between fur seals and small sea-lions in the water.

Now there had been a number of Nova Scotians, Cape Bretoners, and Newfoundlanders sealing out west. When word got around that a new sealing ground had been found, some of these men returned east and got capital interested in Halifax, and the result was that one or two vessels were fitted out to go sealing in South America in 1900. They must have done well, because next year one or two more were sent out and some of them wintered in Port Stanley, Falkland Islands, the nearest British port to the sealing grounds outside the River Plate. In 1903 a fleet of eleven schooners left Halifax for the sealing grounds.

Now in the closing days of December 1903 I was in a ship that was wrecked on the West Falkland Islands.[1] We found a sheep ranch not far from the spot where we landed and stayed at the ranch a few days, until the coasting schooner came along and took us in to Port Stanley on the East Falklands, the only port on the islands that I know of. We arrived there on New Year's Day 1904 and found the sealing fleet of eleven schooners shipping their skins to England. Four of them were new and painted white; the rest were black, but all were very trim and yacht-like, of about 100 tons, 100 feet long—typical Lunenburg fishing schooners

[1] The Falkland Islands are located some three hundred miles east of the Magellan Straits. They were discovered by Captain John Davis in 1592 and settled by the British in 1832, Stanley Harbor being used as a naval base. No trees can be found on the islands, only grassy moorland and high rocky cliffs suitable for sheep raising, which seems to be the main occupation of the people there. The population is about three thousand, Port Stanley having the lion's share of sixteen hundred in 1904. There are geese in abundance to be found all over the islands all the year around. So plentiful are they, in fact, that the government pays a bounty of ten shillings per hundred 'goose-beaks' to save grass for the sheep. Many a hundred geese were killed that year, not for the bounty but for roasting and eating purposes.

of forty years ago. Besides the sealing fleet there were four square-riggers in more or less dismasted state, having had a go at rounding Cape Stiff and getting the worst of it. There were also a British cruiser and a destroyer in port for the holiday.

Now take the bluejackets on shore leave. Mix them up with the sealers and ships' crews. Then add a generous splash of New Year's holiday spirits, and you have a fine dish for a shipwrecked crew, and we enjoyed it immensely.

One of the new sealing schooners had lost two of her boats in a fog on the sealing grounds and I got the chance to go in her as boat-steerer, which I did. Later we heard that the two boats had made their way to land somewhere in Argentina.

The seal hunting season in the southern hemisphere begins in late September or early October. From then on there are two months of good hunting, 'til mid-December when seals become scarce on the grounds. At that time their mating season begins, lasting about three months (December to March). The seals go to their rookeries along the coast and the sealers make for port to ship their skins, Port Stanley in this case. It was there we found them on New Year's Day, 1904.

In late February the sealers would up anchor and one by one leave for the grounds. The distance being from 700 to 1,100 miles, it usually took about two weeks. We were one of the last to leave and were delayed some more when, a few days out, the vessel, running before the wind in a medium breeze, dipped the mainboom in one of the long rollers and before the helmsman could straighten her out jibed her big mainsail over, breaking her mainboom in two places. Now it's quite a job to find room on a 100-foot vessel for a 75-foot spar when you have nine sealing boats on board. The boats are 19 feet long by 4½ feet beam, double-enders that look like small life-boats and they *are very good sea boats*. They can't be nested like dories so they are placed on edge, three to a side on the main deck, one on each side of the mainmast, and the ninth tipped against the cabin aft. All of them are, of course, lashed securely. These boats had to be moved around so as to have one side of the deck clear for repairing the boom. Well, the job was done in a day and a half, but being a new vessel with no spare spars, the boom had to be shortened and we could only set a double reefed mainsail after that.

In due time we got to the grounds and one late afternoon a man aloft shouted, 'Dogsleeper to windward!' The captain eased the vessel gently up into the wind, a boat was lowered, and the second mate who was on watch took his gun and a couple of shells, hopped into the bow of the

boat, and with his boat-steerer and another man doing the rowing brought the seal back with him after one shot. The second mate was quarter-breed Siwash, a man mountain weighing two hundred and seventy pounds, yet quick as a cat on his feet and the best shot in the fleet. Later that evening we saw two travellers crossing our bow, so the captain 'hove to' under ground sails. We were 'on the grounds.' The hunters were loading fresh shells and cleaning the guns; the boat-steerers were filling waterbreakers and seeing to the boat gear; and the cabin boy was getting the lunch boxes ready for the morning. The boxes would have half a loaf of bread, one can of corned beef, one can of salmon, half a pie, and some cookies and hard biscuit. On Sundays we would have lunch tongue instead of Willie (corned beef).

We had breakfast at 3:30 in the morning, lowering the boats just at daybreak. A light wind was blowing and the sea had gone down some. When there is wind, the boats will go out under sail in berths, the lee boat running to leeward a couple of miles and the rest half a mile apart and always behind, as seals can smell a boat as far as they can see one. If a leeward boat lowers his sail after seal, the windward boats will wait for him, usually only a few minutes. He either gets his seal or he doesn't. If many seals are found the hunting becomes general and the boats get spread apart and soon one finds himself out of sight of everything. Then one must be sure that he has a good bearing on the vessel. On calm days the boats can hunt every which way. If much shooting is heard in one direction and nothing is seen where one is going, it is better to edge over that way. One may have better luck.

Now, that first day we had only gone a little while to leeward when the hunter took down his jib and motioned to me to help get the sail in as quietly as possible, saying there were two sleepers ahead. He was a young Newfoundlander, a first year man himself, but he had a half season's experience which I hadn't. When going up on seal, sleepers or any kind, both men stand up pushing on the oars, but getting close the boat-steerer takes his pushing board and sits down, which gives him better control. The hunter probably wanted to train me to stand up for he didn't mention the board. Well, we got very close and my knees were knocking with excitement. The hunter was ready to shoot when a small wave slapped the bow of the boat and both seals went under in a flash. 'Keep your oars out of the water!' was the command. In a few seconds the seals came up, one on each side of the boat. He fired once at each side and missed both of them. He picked up his other gun and watched, swinging his gun from side to side and I stood looking goggle-eyed all around. After

a while we saw the seals breaking out of the water like porpoise away ahead. We chased them but saw no more of them. I got some fatherly advice about pushing a boat into a wave when going up on a sleeper and such. Later we got two or three seals that day and some of the boats had eight or ten.

The easiest seal to get is a sleeper of course. There are four different degrees of soundness. The dogsleeper is the soundest sleeper of all. He is found in stormy weather, a young seal all by himself that gets tired and goes to sleep with his back just awash and his flippers hanging, looking dead. Only his nose comes up to breathe once in a while. They all sleep with nose to windward, so the boat must be pushed up to them from the leeward. One watches his chance and shoots for the back of the head.

The next best is a jughandle. He sleeps on his side with the hind flippers curled up in the air towards his head and one fore flipper laid over them and the other fore flipper hanging straight down usually. His head and neck lie straight along the water. He looks just like a jughandle from a distance. One pushes up on him and picks the side where the back of his head is. The throat shot is not so good.

Next comes the breaster. He sleeps with his flippers crossed, not tight on his chest but up in the air, making the shape of a squat O. His head and part of his body hang down. He is only half asleep, so be careful. If he is shot in the breast and not killed, he will go down, his lungs will fill with water and he will drown. Some hunters shoot in the flipper joint to make him come up and jump around and perhaps allow a better shot later.

The finner is next. He is only half asleep. With his one fore flipper sticking up in the air and head and body down, one has only the flipper joint to shoot at. If left alone awhile he might curl up into a jughandle, but one does not waste time when among seals.

It often happens that a big bunch of sleepers are found, five or six or seven. Six is the most I've ever seen together. The old experienced hunters will 'double up' with the first gun; that is, they will place the boat is such a position that two seals will be close together and in line. Then they will hit the first seal in the head and the second across the back as he turns to go down, all within a fraction of a second. If the second shot is well placed across the small of the back, it will paralyze the hind flippers, making the seal jump around frantically. The other seals usually go straight down and straight up again. One may 'nose' at the dead one, making a good target. The others will hang around the

crippled seal; then you gaff the dead ones and go after the others. With luck, if the water is smooth, one is sure of the cripple and of one or two more. But such shooting is not done by a green hunter with a greener boat-steerer. *We* never got more than one or two out of a bunch.

Sealing is not all sleepers, however. One has to go after anything one sees, such as travellers and moochers. Moochers go along slowly as if they were looking for a soft spot to sleep on, and present a good target if taken unawares. Travellers go in one direction at a good rate of speed, looking for bait no doubt. For effective shooting one must get within one hundred feet of the moving seal. A small sleeper can be killed at one hundred and fifty to two hundred feet, but big ones are tough.

The guns used are 'Parker' hammerless, 32-inch, double-barrelled 12-gauge. Brass shells are used so they can be reloaded. The usual load is three and a quarter drams of black powder and twenty-one buck shot. Some hunters use four drams of powder and twenty-eight shot, claiming seven more chances; but such a load fills the shell right up to the top and often, when one barrel is fired, the shot will jar the wadding loose in the other shell and the twenty-eight shot will run out of the barrel, leaving the shell blank. To fix that, pour a box of wadding into a can of paint oil, drain off the oil and let the wadding dry. Thus prepared, it holds very well, but the gun will kick like a steer and if it is easy on the triggers both barrels will go off—'wow'!

The hardest work of all is chasing seal among a school of porpoise. They not only go faster, but they won't hold their direction long. They go down; one can see them under water a little way and one gets the gun ready; then one can't see them at all, and a minute later they may reappear dead astern going the other way. So one earns one's salt getting seal that way. Also, travellers, if heavy seals, will sink very quickly if killed broadside of the boat. Even with a 17-foot gaff (carried in every boat) one will lose a few by sinking; especially if the boat is heavy with seal so that it can't be turned easily.

It's best to start skinning when you get five aboard, unless there are so many seals around that you can't stop. One boat had twenty-nine aboard one day. The skipper paddled to the schooner, unloaded, went out again and got eight or ten more. Skinning in a boat is done on a skinning board, a piece of canvas tacked on two pieces of wood reaching across the gunnels, just like a small stretcher, with two end pieces to hold the board flat. First cut off his whiskers; rip down his belly, chin to tail; cut round his flippers front and back with the sticking knife. Then, with the skinning knife, which is curved like a scimitar, start from the

chin, cut down toward his tail, holding the freed skin in the left hand, like peeling a log, and leaving a fair amount of blubber on the skin to hold the salt.

The skins are salted in the hold every night. Every inch of the blubber side of the skin is rubbed carefully with salt, placed flat, and covered with more salt. The next skin, treated likewise, goes on top and so forth until the catch is all salted.

If the daily catch is good, the captain will keep the vessel 'hove to' on the same spot. If the catch gets scant, he will ask every boat, 'Did you see many travellers and what direction did they go?' He will then follow in the night the seal so as to keep in touch with them. Once in a while he does not catch up or over shoots. Then the boats may have a day or two without much luck.

Travelling seal instinctively hunt for bait, schools of small sardine-like fish on which they feed. If we row two or three hours without a sign of a seal, we watch flying birds. They hunt bait too. We follow them and soon may see a flock wildly flying around. They are in a bait sure. A bait can be seen a mile or more away, showing purple against the blue or green of the sea. We get closer. There is something black in it—seals! We edge to leeward, then push up to it; make sure of the first shot and get in two or three more if we can; pick up the dead one, reload, and get after the cripples.

Sometimes we may find a whale or two in a bait, as well as seals, and sea-lions, porpoise, turtles, and birds of all kinds feeding off the same bait. We must then approach carefully to try to make our kill on the edge of the bait and gaff him quickly. The other seals, if any, will get on the other side of the whale where we can't get them, except by rowing around the whale, only to find ourselves still on the wrong side. Don't go right into the bait. The whale might come up under the boat, which happens sometimes even outside the bait. The whale will slide through the bait, belly up with mouth open, and do a slow barrel roll, and then repeat—all very quietly and peacefully.

If a swordfish should appear on the scene, look out for trouble. There may be a killer whale around also as they usually hunt together. The swordfish jabs the whale from underneath, driving him up to the surface. The killer then jumps in the air and turns and drives his sharp boney backfin into the whale, cutting him into ribbons. Thus attacked, the whale will break blindly full length out of the water, dripping gore and blubber, and the best thing for puny man and his little sealing boat is to get away from there quick.

In foggy weather the hunt goes on just the same, except the boats don't leave the vessel before daylight as they do in clear weather. Every boat has a fine little spirit compass fastened to the thwart in front of the boat-steerer. It is his job to keep a good bearing on the vessel at all times. The captain keeps the vessel 'hove to' all day and keeps the foghorn going. The bomb gun is fired once an hour by the cook, whose job it is to load and fire it on the hour. The gun is a small muzzle loader weighing one hundred pounds. He loads it on deck, using a milk tin full of powder and paper and rags for wadding. Then he hoists it up in the fore-staysail boom lift some eight feet above deck and fires it with a red-hot poker. It can be heard perhaps five or six miles in calm weather and both men in the boats listen for it to check their bearings, usually keeping within sound of it all day. But if one should run into a bunch of seals, one forgets everything but the hunt and often gets out of sound of the gun.

The biggest danger in fog is a tide-rip. One may be five miles from the vessel, chasing a seal into a tide-rip. In calm weather this does not appear to be any different from the rest of the sea, except by a slight ripple at the very edge of it. Yet it may carry one four or five miles an hour away from the bearings if he is not careful. Usually there is a string of birds sitting along the edge of it, also, there and here a bunch of seaweed and other debris. In the heat of the chase, however, one misses things like that and sometimes finds himself out of sound of the gun when darkness falls. We once got back to the schooner at 1 A.M. having passed her some five miles to windward and gone some two miles beyond, when it breezed up, clearing the fog, and we could see a flare at her main truck. That's what a tide-rip can do to you.

Sometimes people will ask, 'Is sealing very dangerous?' I should like to say that it is no more dangerous than any other seafaring trade. Sometimes a boat may get lost in a fog or even get lost by other accidental means, but that happens on the fishing banks just as often. A man may get washed overboard in a storm from any ship. But at times a drowning occurs that could be prevented. Take, for example, the incident of one of our young boat-steerers. He was on the morning watch with his hunter at the wheel, and, being on the lookout, he went to take the sidelights down at daybreak. He got the windward light down first; then went to leeward outside the shrouds. The fore-sail must have given a hard slap just as he got the light out of the screen, breaking his hand hold; and the heavy light, weighing some forty to fifty pounds, carried him down and under and sad to say not even his hunter, the man at the wheel, saw him go. Had he gone up on the *inboard* side of the lee shrouds, he would

not fallen overboard. Still, I have read about somebody drowning in a bathtub.

That season, with eleven schooners on the grounds, it was not unusual to find ourselves within sight of one or two or them, and we often visited on board for a few minutes. There is always hot coffee in the galley for such a visit. While swapping the latest sealing news and praising the cook's pie, we are pointed out the bunk of someone we know well. After tying the victim's blankets in knots and hiding his pillow in the chain locker, we blithely bid the skipper and cook goodby and hop into our boat—to find her half full of water! The cabin boy has pulled the plug out and put it back again with a match along the side, causing a slow leak. Well, we had our fun and so did they and playing pranks doesn't hurt anybody.

We had a Newfoundlander aboard, the complaining long-suffering kind, but not above playing a trick if the chance offered. Once he went aboard another vessel, had his coffee and pie, found a friend's bunk and spiked his mattress to the under side of the deck. Then he got into his boat, hoisted his sail, and went sealing again. After a while his hands got cold so he stooped down to get his mittens from the bottom of the boat, only to find them carefully nailed down right through the planking.

While making a passage, the boys used to play a game called 'leather breeches.' The fore-sail halyards were coiled up on the bow of a boat and the man who was 'it' stuck his head in the coil, the rest of the men standing around. One of them would slap the victim sharply where his pants were tightest. He would have to pick out the man who did it, or stay 'it' until he did. A fine game in cold weather—everybody kept warm.

In late April and early May a storm is likely to keep the boats from sealing four or five days at a time. One may get a few clear, warm days only to find that the storm has gotten him out of touch with the seals; and, after hunting by day and cruising from one end of the grounds to the other by night with the catch getting smaller every day, another storm will come up to keep the boats on board a week maybe. Then it is the end of the season and the schooners will leave the grounds. Those heading for Halifax and home will call at some Brazilian port on the way to ship their skins.

Our vessel and another headed for Port Stanley, Falkland Islands, to lay up for the winter. Upon arriving in port, the first job to do was to get our catch of skins ready for shipping to England. All sealing vessels bring their barrels 'knocked down,' carefully marked and stowed in the hold. Two men are set to work coopering. The rest set to work on skins.

The old salt is shaken off, fresh salt is rubbed in, and each skin is rolled up into a small tight roll. These rolls are then tightly packed into the barrels with plenty of salt all around them, the barrels holding between twenty to forty skins.

After the skins were shipped there was not much to do except to go ashore whenever anybody felt like it. A new mainboom was made during the winter from a ship's yard, of which there seemed to be a good supply stored along the shore, no doubt from the many hulks anchored all over the harbor.

After four months lay up we were all glad to leave port in early September for the sealing grounds, reaching there a bit earlier than usual and finding very few seals. We got only a hundred the first three weeks and no doubt the catch of the eleven schooners the year before had something to do with the scarcity. The captain, talking it over with the hunters, decided to raid a rookery along the coast of Uruguay. The largest rookery there is 'Lobo's Island,' off the mouth of the River Plate, belonging to Uruguay and having a coast-guard station. Raiding that was out of the question, but to the north some eighty miles were two smaller rookeries, 'Castillo Chico' and 'Castillo Grande'; and there we found ourselves at daybreak one fine morning. The rocks were a half mile offshore in a shallow bight of the coastline. To the northeast there was a high promontory; to the south, some seven miles away, a rocky point with a lighthouse on it.

The day was fine, almost calm, and there were plenty of seals on the rocks. We got two hundred skins that day and everyone was happy making for open sea that night. The hunters skinned by lantern light; the mates and boat-steerers salted in the hold. No sleep that night. Shells had to be loaded for the morrow; and daybreak found us at the rocks again. The weather was still fine, but the seals had been pretty well cleaned out. We got only a few over a hundred, but still it made a good day's work and a happy crew going to sea that night.

The third morning found us at the rocks again. A long swell was running and the sky was a hazy gray. We had barely got to the rocks in the boats when one of the boats got caught in a breaking swell, smashed against the rock and stove in pretty badly. The three men managed to climb onto the rocks after swimming around some. They even pulled the boat up with them, but they lost the guns, shells, and the rest of the boat gear.

When hunting seals around a rookery, three men are needed in a boat: two on the oars and the hunter tending to his guns and to gaffing the dead

seals. I was pulling in the mate's boat that day and he drove his boat into the rock, but got the men off and their boat too. We started for the vessel which was lying a short distance off, towing the boat full of water. We saw the cabin boy run up the rigging and wave the flag. That means, come on board quick! All boats started for the vessel, arriving there ahead of us. We looked around and saw the revenue cutter rounding the light-house point to the south of us. We hustled on board. All sails were set, boats lashed down, and we started to beat it out to sea. The wind was blowing straight in, so, because of the coastline, we could not go on the starboard tack. We had to take port tack, which would take us across the cutter's bow. She had us bottled up for fair. Some of the boats brought four seals on board. We had no time to skin them, so they were dumped whole into the hold and covered with salt.

When about three miles off, the cutter fired a shot overhead. The captain, at the wheel, paid no attention. A few minutes later another shot came across our bows. Still no attention from the skipper. A third shot came, dead ahead and very close, but the skipper kept her on her course. When less than half a mile away, a fourth shot came whistling at us. It must have gone between the spars, for everybody felt the wind of it. The captain then brought her up in the wind, waiting. While all this shooting was going on, I wondered how long he intended to ignore the shots of the cutter, knowing full well that he could not get away. Later it came to me that he wanted to get outside the three-mile limit, and he did just that before he hove to.

The cutter came alongside and ordered our captain to come on board. He sent one of the hunters instead and told him to say we were in looking for water, as our water was bad. A few minutes later the hunter came back, accompanied by an officer and two marines armed to the teeth with orders to send half the crew aboard the cutter. The officer and marines took charge of our schooner and we were thus officially seized by Uruguay.

Seven boat-steerers and one hunter went aboard the cutter. She was steel built, about two hundred feet long, and had a three-inch swivel gun mounted on her fore-deck. On boarding her, we were told to go aft and sit down. There was a big hawser grating at the round of her stern. We coiled the hawser, making a comfortable rest for our backs, and sat on the grating. A package of tobacco and cigarette papers were given to each man and there we sat the whole day, smoking, singing, and swapping lies, while the cutter headed for Montevideo with the vessel following under shortened sail.

At seven that night the cutter tied up at a small coast-guard station within the River Plate, some fifteen miles from Montevideo. It was named 'Flores Island,' no doubt because of the profusion of wild flowers growing there. We were given soup and rolls for our evening meal and *it was good!* We had had nothing since breakfast at 3 A.M. that day. We spent the night on the grating, talking most of the time, and at daylight the vessel hove in sight. The captain had taken his time, no doubt wanting to make his freedom last as long as possible. The cutter backed out and took her in tow for Montevideo, where she was anchored some two hundred yards from the Custom House in the inner harbor.

We were put back aboard the vessel and had a good breakfast in the forecastle, where we found a note from the cook. It told us to say, when questioned, that we had been in looking for fresh water, as our water in the tanks was very bad. In the meantime, a lot of 'Gold Braid' had come aboard with interpreters. We were taken one by one to the cabin for questioning. Everybody had the same story—'Bad water.' A sample of water was taken from our tanks for analysis and was found very bad. A guard of four *marineros* and an officer were left on board and here we laid up for seven months and a half, the guard changing morning and night and bringing us a tub of fresh drinking water daily from ashore.

Our water really was bad. Port Stanley has no public water supply and every house uses rain water; of which there is plenty. Most of the houses are of corrugated iron construction with tanks at each corner to catch rainwater. The sealing schooners, on the way out of the port, would anchor at Sparrow Cove, about half way through the narrow entrance to the harbor. A small creek of fresh water runs into that cove. The sealing boats would be sent up along the creek, filled with fresh water and rowed out to the schooner, where the water was emptied into the tanks. That winter, 1904, was, perhaps, a bad one, for numerous dead sheep were floating down the creek when we filled our tanks.

The first two months in Montevideo we were all confined to the vessel. Although covered with salt, the four dead seals that were dumped into the hold the morning we were seized had rotted. The whole ship smelled like a glue works and white maggots were crawling all over. They had to be gotten rid of somehow, but how? The hatches were sealed, so one rainy night when the guard was huddled under a boat on deck, the two mates crawled from the cabin to the store-room and thence to the hold. They cut up the seal carcasses, put the pieces in bags, dragged them back the same way, and dumped them overboard. I don't know how they got by the officer. He usually stayed in the cabin all the time. Well, those

bags would float out with the tide and come right back again on the next incoming tide, and for a week that went on until they finally disappeared.

It was now midsummer and pretty warm, so we got permission to go swimming around the vessel, and a month later we could go ashore on the promise not to leave the country. Five of the boys did leave and nothing was done about it. One or two court decisions had been passed. Each one had been appealed by the ship's lawyer and we were now waiting for the supreme court to act on our case. The decision came sometime in late June. The schooner was confiscated; the captain was in for three years, the mates one year each, and the crew six months. Having been there over seven months we were free to go and were sent home as consul's passengers. The time we spent in Montevideo was made very pleasant by the courteous and considerate treatment we received from all officials and civilians we came in contact with. We were treated more like paying guests than captives.

In the meantime, an international lawyer was sent to Montevideo from Liverpool, Nova Scotia. He cleared the vessel of all charges and made a few on our behalf—illegal seizure outside the three-mile limit and holding the vessel in port over seven months without a specific law on the books covering such a seizure. The schooner's owners, having furnished our provisions all the time we spent in Montevideo, then presented a claim for damages amounting to $60,000.

After seven years of diplomatic stalling the claim was paid. Each crew member that could be found received a share based on the estimated average catch for that year, 1905. Sealers are not paid a monthly wage. They are paid for the skins they catch in their own boat. And so ends my sealing trip.

Notes

Washington's Boat at the Delaware Crossing

General George Washington's passage across the Delaware River on the night of 25 December 1776 was in view of its consequences one of the most important voyages on North American waters. It has been memorialized time after time in verse and prose, and the number of pictures of the scene is countless. Yet with all the interest in the event, the type of craft actually used to transport Washington and his little army over the thousand odd feet that separate Pennsylvania from New Jersey is known to but few persons.

The general conception of the boat is that gained from Emanuel Leutze's painting now owned by The Metropolitan Museum of Art. It shows Washington surrounded by his staff (there are twelve men in the boat altogether) standing in what seems to be a craft similar to a ship's long-boat. It is a square-sterned, carvel-built, round-bottomed open boat about 15 feet long. There is about 10 inches of freeboard showing. It is being propelled by three men using oars while a fourth steers with a paddle. One man is stationed in the bow fending off a block of ice that is at least 10 inches above water.

An examination of the internal evidence shows Leutze's conception to be a complete impossibility. First, the number of men shown would probably have put her gunwales under. Second, assuming they all could have crowded in and the boat remained afloat, such a craft due to the shallow water would not have been able to come within twenty feet of the bank on either side of the river. Third, the number of men propelling the craft would have been hard put to it to make any headway across the current. Fourth, it is unlikely a craft of the long-boat type would be found anywhere near the point of crossing because the falls at Trenton—the head of navigation on the river—would preclude the passage of such a boat further up-stream. Fifth, the thickness of the ice is preposterous. True there was some, but reliable contemporary accounts of the weather indicate that the upper river had frozen a few nights before the crossing, but that the succeeding days were warmer and the ice had broken up. Yet Leutze shows ice cakes several inches thick. Furthermore, had the ice been as thick as the artist shows it, Washington might never have had the chance to cross the river. General Howe probably would have done it instead, using the ice as a bridge. There was ice aplenty the night of the crossing, so much, in fact, that it prevented some of the Continental force farther down the stream from getting over the river. But it was the quantity of ice, rather than its size which gave the trouble. In addition to these mistakes, there are others, such as the use of the stars and stripes about six months before that flag was authorized by the Continental Congress.

If then the whole scene is a figment of Leutze's imagination, what type of boat did Washington use?

Early in December 1776, it will be recalled, Washington's forces were in full retreat across New Jersey with Howe in hot pursuit. Lying athwart the path to safety lay the Delaware River. Washington knew that if he could get his army over the stream, and prevent Howe's passage, he would not only save his army but also the capital city, Philadelphia. There were, of course, no bridges and no fords along his route. Hence boats were needed and on 1 December he dispatched Colonel Richard Humpton ahead towards the river un-

der orders 'to collect proper boats and craft at the Ferry for transporting our Troops.'[1] Humpton assembled all the rivermen he could find and under the leadership of Jacob Gearhart, Daniel Bray, Uriah Slack, and Thomas Jones they collected all the craft along the Delaware and Lehigh Rivers.[2] At least twenty-five and probably more boats were found and secured.[3] After these had been used by the retreating army, they were hidden behind Malta Island and in Knowles Creek out of sight of the Jersey shore, apparently with a view of use at a later date.[4] That time came when Washington re-crossed the Delaware on Christmas Night and falling on the still celebrating Hessians captured the majority and routed the remainder.

The type of boat used by Washington is definitely named not once but twice in his official papers. First in the orders to Humpton he was specifically directed to 'particularly attend to the Durham Boats which are very proper for this purpose [transporting troops].'[5] Second in a letter to William Livingston, Governor of New Jersey, Washington wrote 'The Boats and Craft all along the Delaware side, should be secured: particularly the Durham Boats . . . One such Boat would transport a Regiment of Men.'[6]

With all their claims to fame, little seems to be known of these Durham boats. Early in the eighteenth century a blast furnace was established a short distance from the banks of the Delaware in what is now Bucks County.[7] This was the Durham Iron Works, one of whose first engineers was Robert Durham. It is said that about 1750, needing craft in which to ship his iron to Philadelphia, he built the first boat which was given his, or the Works' name.[8] For just a little over a century the Durham boat was in use on the river, hauling iron and grain, whiskey and other local produce down and light loads of manufactured goods back up stream. In 1860 the last trip to Philadelphia was made by the Durham boat and since then practically all memory of it and its design has disappeared. Fortunately, however, one old riverman well acquainted through personal experience with the boats has recorded his recollections of them.[9] Based on his descriptions and under his supervision a drawing of the type was made. Through that several contemporary pictures of Durham boats have been identified. (Plates 21-22.)

In length the Durham boat averaged about 60 feet over all, with a top size of 66 feet. Its beam was about 8 feet. The depth of hold from the top of the keel plank to the gunwale was about 3 feet 6 inches with 10 or 12 inches hang of the sheer at the ends. She was a double-ender with a curved stem and a straight raking stern-post. The mid-section showed almost vertical sides, a round hard bilge, and a flat floor; the ends were full. For a greater part of the length the sides were parallel, curving in to the posts about 12 to 14 feet from the ends. The structure was very simple: on a 12-inch wide plank for a keel the stem- and stern-posts were fastened with knees. Natural crooks fastened to the keel planks were used as frames, then

[1] John C. Fitzpatrick, editor, *Writings of Washington* (Washington, 1931-), VI, 319. Washington to the President of Congress.

[2] Richard Randolph Parry, *Coryell's Ferry in the Revolution* (New Hope, Pa., 1907), 4; William S. Stryker, *The Continental Army at the Crossing of the Delaware* (Trenton, 1896), 7; John O. Raum, *History of New Jersey* (Philadelphia, 1877), I, 443.

[3] War Department Archives, Affidavit of John Clifford cited by William S. Stryker, *Battles of Trenton and Princeton* (Cambridge, Mass., 1898), 130 *n.*

[4] Stryker, *Continental Army*, 7.

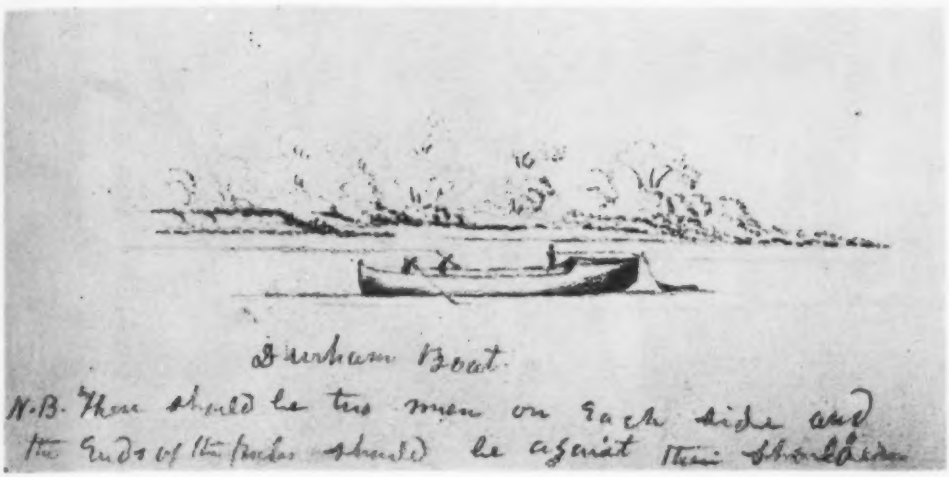
[5] Fitzpatrick, op. cit., VI, 310. Washington to Humpton.

[6] Ibid., VI, 319. Washington to Livingston.

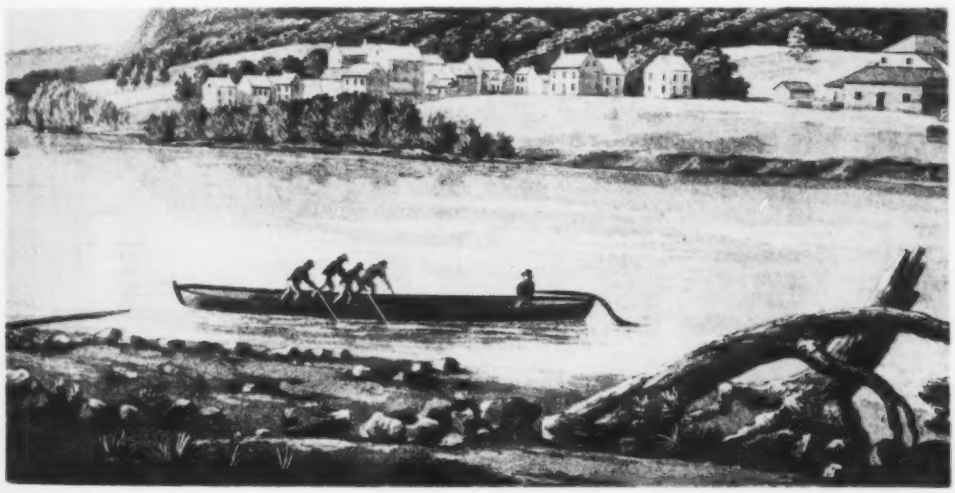
[7] Arthur Cecil Binning, *Pensylvania Iron Manufacturing in the Eighteenth Century* (Harrisburg, 1938), 53.

[8] W. W. H. David, *History of Bucks County* (Doylestown, Pa., 1876), 646.

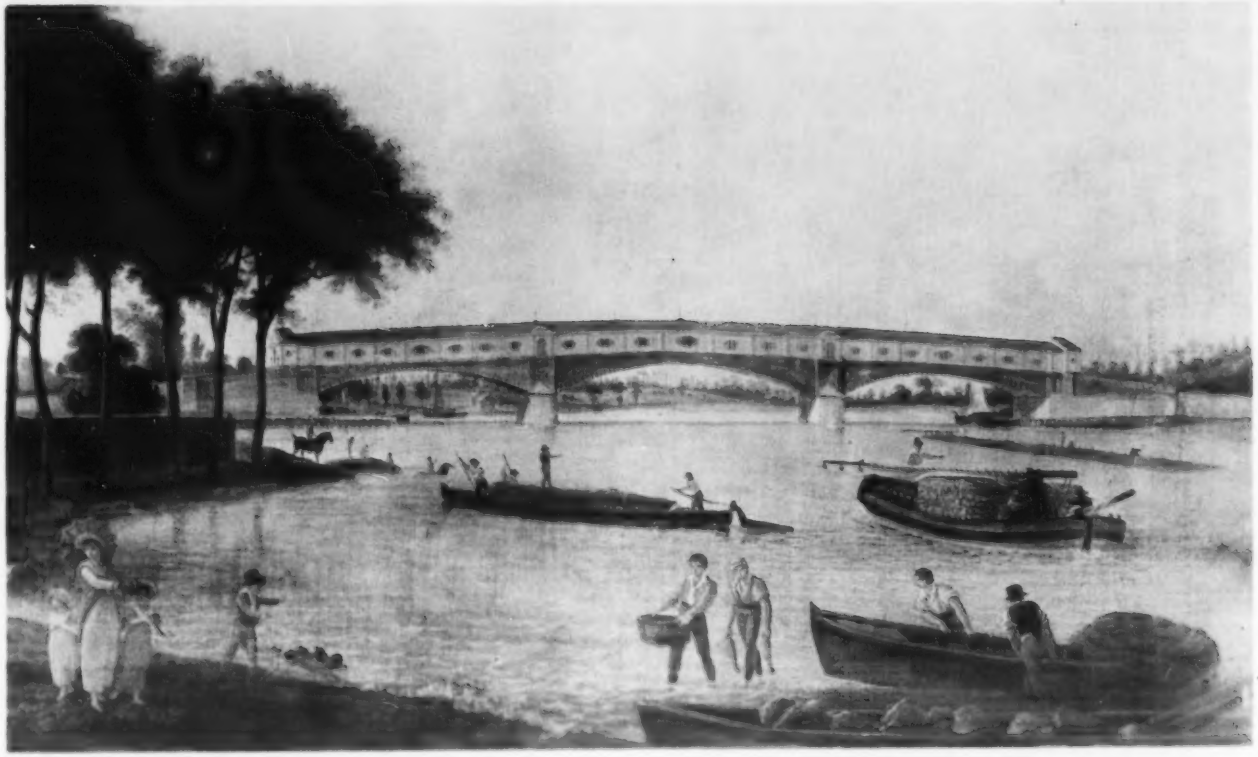
[9] John A. Anderson, 'Navigation on the Delaware and Lehigh Rivers,' *Bucks County Historical Society Papers*, IV (1917), 282 ff.



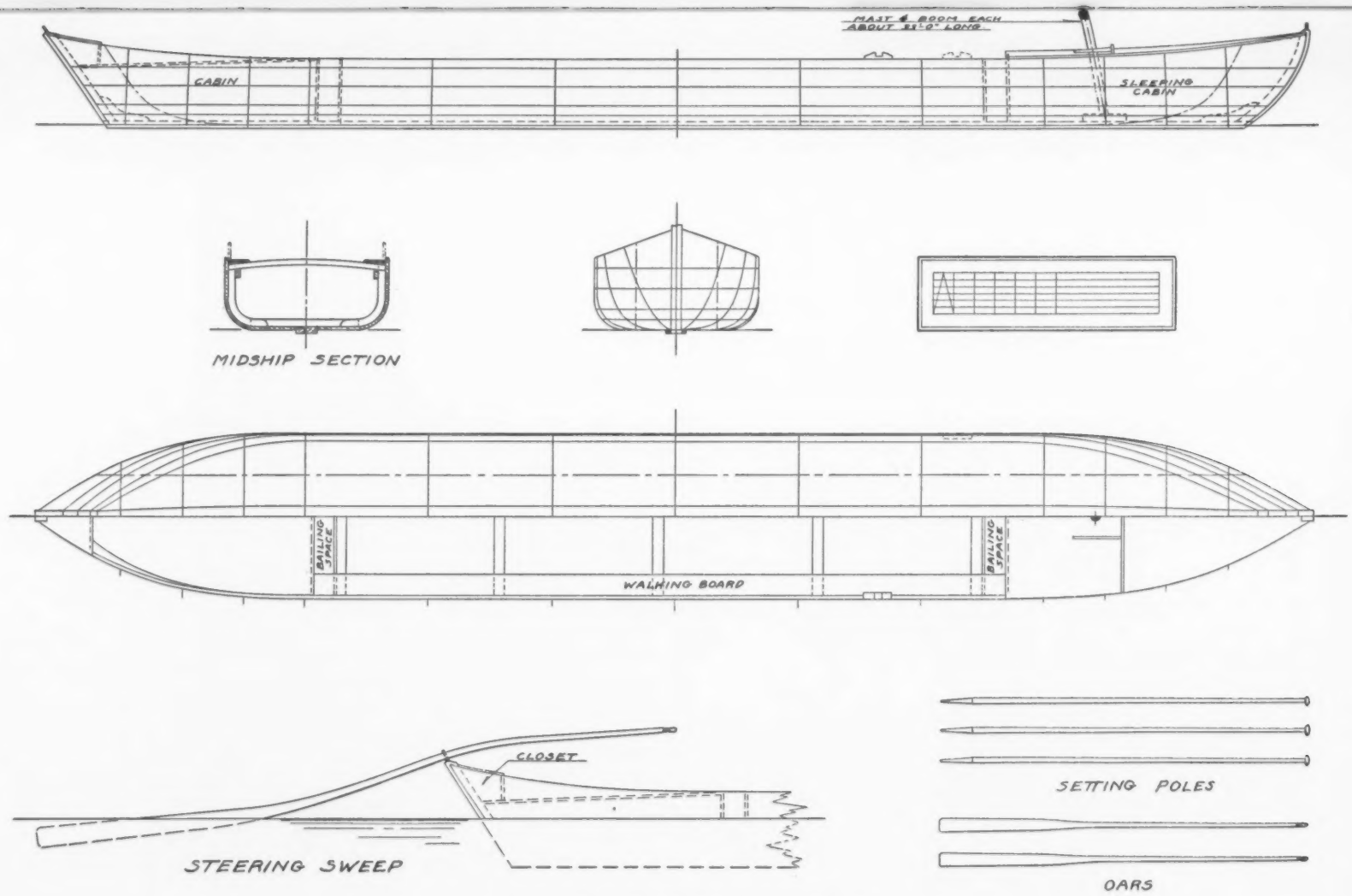
Pencil sketch of a Durham Boat, possibly by Thomas Birch



A Durham Boat, about 1800. Detail from an engraving by William Strickland, *View of Delaware Water Gap*



Market Street Bridge, Philadelphia, about 1805, by John James Barralet. A Durham Boat is in center left



Durham Boat of the Delaware River

Drawn by Edward G. Brownlee after drawing of John A. Anderson, Bucks County Historical Society Papers, *IV (1917), 282 ff, and existing records*
Scale: 1/8" = 1'

the bottom and side planking were applied, the seams caulked, and the whole boat painted black. Strange to say the boats were not given names.

At each end where the curve in towards the stem and stern began were short pieces of deck. That at the bow was flush with the sheer and cambered; that at the stern was flat and sloped down slightly towards the post. About the center of forward deck was the mast partner. At the after end of the stern deck was a small triangular locker, and a scupper. Under each deck was a small cabin. Along each side laid on thwarts were 12-inch wide pieces of lumber called *walking boards*; these gave a footing for the crew as they poled the boat up stream. On each gunwale well forward was a notched block of oak to serve as an oar lock. Occasionally there were two oar blocks on each side.

Going down stream 18-foot oars were used to supplement the current, the captain steering the boat through the rapids by means of a 30-35 foot curved sweep pivoted on a pin in the top of the stern-post. The downstream cargo was generally flour, corn, wheat, iron or whiskey. Between fifteen to twenty tons could be carried. Light, the draft was 3½ to 5 inches; loaded, it was about 24 to 30 inches. In running through white water the walking boards were set up on edge along the gunwales as *splash boards*. In case some water did get in, or the boat leaked, *bailing places*, set off from the cargo and cabin spaces at each end by thwartships bulkheads, collected it for the bailing buckets.

On the up-stream trip only two or three tons of manufactured goods were carried. Then the boat was propelled by *setting poles*, iron shod at one end, and with a *button* at the other. In using them, the men, one on each side at the bow, faced aft and put the shod ends on the river bottom, with the buttons against their shoulders. Then they walked aft along the walking boards pushing on the poles. When they reached the after deck, the captain with a short pole, shoved the boat forward for the length of the deck (the down slant gave him a good footing) while the crew ran forward with their poles to repeat the operation. If the wind were fair, a triangular sail was set on the mast. Neither center-board nor lee-board was ever used on the Durham boat.

Life aboard the boats was exceedingly simple. All hands slept on straw under the fore-deck when the boat was tied up for the night. Cooking was done on a charcoal box, usually an old cast iron pot with a piece of strap iron across the top to hold the pan. Whiskey was far more important than food to the rivermen and a plentiful supply was always carried.

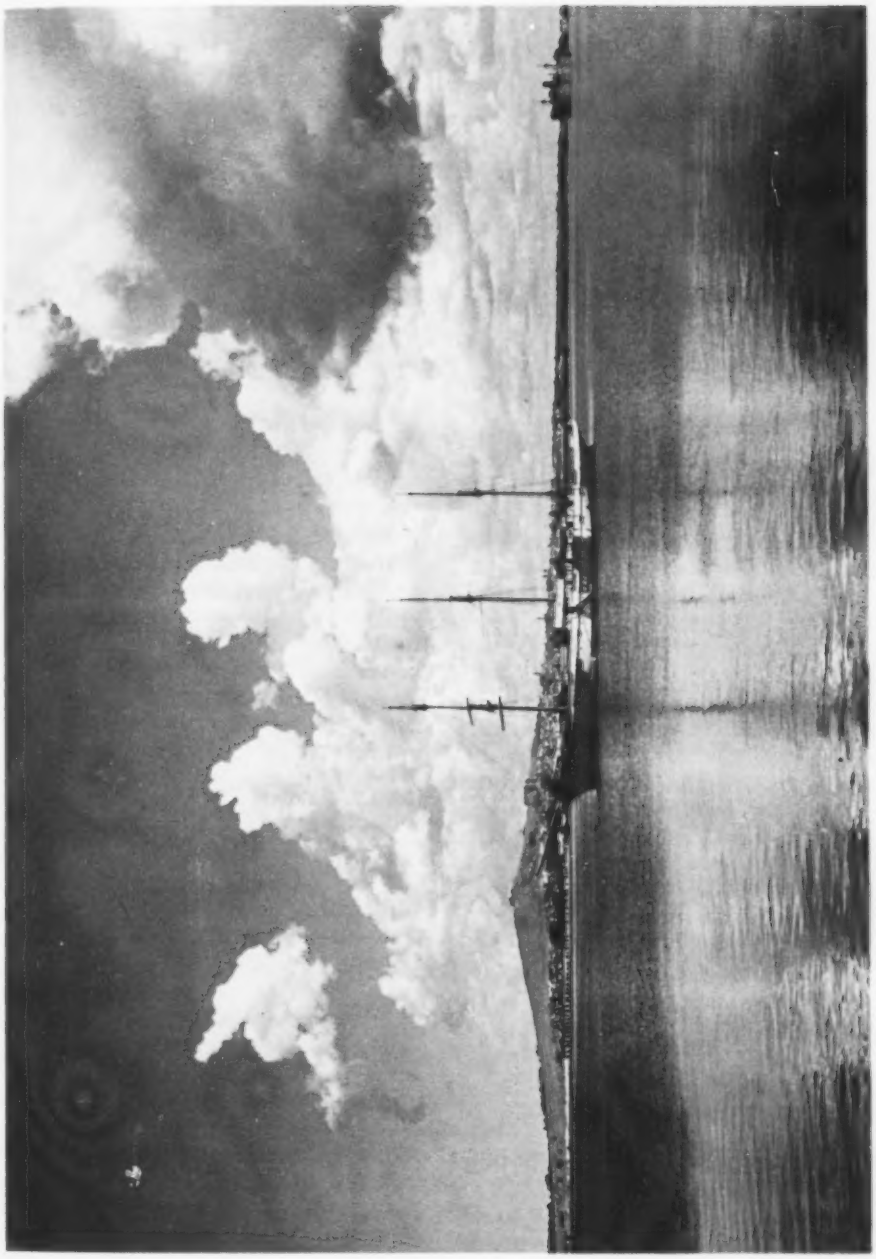
A canal parallel to the Delaware River was opened in 1834, and the use of the Durham boat began to decline in the face of competition. The final blow came with the completion of a railroad along the river bank in 1854. Within another ten years the Durham boat had become extinct.[10]

M. V. BREWINGTON

Memorandum referente al R. O. U. *18 de Julio*

[The following account of the former gunboat *18 de Julio*, by Captain Oscar Tagle of the Uruguayan Navy, has been received through the kindness of Alvaro A. Araujo, Director of the Inter-American Bureau of Information in Montevideo. The *18 de Julio* (formerly the yacht *Normandy*, ex *Lady Nell*) was purchased in 1906 by the Government of Uruguay to replace the gunboat *General Rivera*, which had blown up in October 1903. The *18 de Julio* remained in active service until 1931. The photograph of the vessel (Plate 23) was taken by Messrs Armellino & Cia of Montevideo. In the background appears the Montevideo *Cerro*, on the top of which is an old Spanish fort, now a naval museum.]

[10] B. F. Fackenthal, 'Improving Navigation on the Delaware River,' *Bucks County Historical Society Papers*, VI (1927), 9.



Uruguayan gunboat *18 de Julio* in Montevideo Bay

Photograph by Messrs. Armellino & Cia. of Montevideo, received through the kindness of Alvaro A. Araujo

Obverse: Legend, IACOBUS · II · ET · MARIA · D · G · MAG · BRI · FRAN · ET · HIB · REX · ET · REGINA · Busts of the King and Queen conjoined to right, the King laureate and in scale armor, draped; the Queen draped. Under truncation, G. B. (George Bower, an engraver at the Royal Mint).

Reverse: Legend, · SEMPER TIBI PENDEAT HAMUS · . In the distance a ship viewed from the port quarter, a rowboat in the middle distance and in the foreground a larger boat and exposed timbers of a shipwreck. In exergue, NAVFRAGA REPERTA 1687.

Edge: Smooth. *Metals:* Gold and silver.

MEDAL STRUCK IN 1687

Commemorating the recovery of shipwrecked treasure by Sir William Phips off the coast of Hispaniola. The illustration is actual size of the medal.

A RAÍZ de la explosión de la Cañonera *General Rivera*, acaecida en octubre de 1903, y la cual ocasionó varios muertos y heridos, se inició una suscripción popular, a fin de recolectar fondos para reemplazar este buque. En los primeros días de 1904, habiendo estallado la revolución, esta idea quedó relegada a segundo plano, no obstante haberse reunido en ese lapso de tiempo la cantidad de $35,000.00. Al final del año 1906, habiendo efectuado el Comandante Valverde —en el aviso *Ingeniero*— un viaje a Buenos Aires— vió en la Dársena Norte, un buque que había llegado recientemente, y que por sus características, podría reemplazar a la citada cañonera.

El buque mencionado, era el yacht *Normandy* de 520 toneladas, casco de acero y con aparejo de paylebot latino. Dicho buque, había llevado con anterioridad el nombre de *Lady Nell*. Traído a Montevideo, fué adquirido por la suma de $50,000.00, en Presidencia del Sr. Don Claudio Williman.

Fué tripulado por un Comandante, un Segundo y cuatro Oficiales, como plana mayor, y 60 marineros de tripulación. Fué armado en el año 1908, con dos cañones Maxim Vickers de 47 mm. y 4 ametralladoras.

Esta nave, prestó eficientes servicios de vigilancia, durante su vida activa en la Marina, que lo fué hasta el año 1931, habiendo sido radiado en esa epoca y dejado como pontón-escuela para grumetes.

En el año 1917, fué reformado el aparejo— de paylebot por el de lugre— a fin de cumplir mejor la misión a que se le había destinado en los finales del curso de la Escuela Naval, la cual hacía sus prácticas anualmente.

La cañonera *18 de Julio*, intervino en una serie de salvatajes y misiones diplomáticas, durante su estada en la Marina, como también sirvió de barco de entrenamiento y práctica para los alumnos de la Escuela Naval. Actualmente presta servicios, como sede de la Escuela de Marineros.

OSCAR TAGLE

SIR WILLIAM PHIPS' TREASURE

WILLIAM Phips, born in 1651 on the shores of the lower Kennebec, uneducated son of an early settler in that region, might properly be called New England's first 'self-made man,' for, despite the handicap of being one of over twenty children, made fatherless in youth, and entirely without advantages of any sort, he raised himself by his imagination and indomitable will to knighthood and the office of first Royal Governor of Massachusetts.

At the age of eighteen Phips, like many other lads of his kind and time, had persuaded himself that opportunity and fortune were to be found not on the sparse New England soil but on the wide sea. A period of apprenticeship in shipbuilding near his birthplace was followed by a move to Boston where, then twenty-two years old, he followed his trade, applied himself to learn to read and write, and before long won himself a wife, promising her a prosperous future which was to include 'a fair brick house in the Green Lane of North Boston.'

These were the days of unbelievably rich shipments of silver from Spanish America to Spain, the days of the great pirates and shipwrecks of treasure laden galleons. Every waterfront of the Colonies hummed with tales of buried or lost treasure, and to Phips' ambitious brain these were a hardly needed stimulus. In 1681 he made his first voyage to the Caribbean, returning home convinced that he had learned the location of sunken treasure and needed only a proper ship and hands to recover it.

A trip to England, a climb up the ladder of favorites of Charles II, a year of perseverance, brought him in 1683 the captaincy of a King's ship and a venture in which his Majesty had a share. While Phips' information proved incorrect and he retrieved no treasure, a visit to Puerto Plata on the north coast of Hispaniola gave him new hope that his sought for wreck lay near by.

An enforced return to London in 1684 and the succession of James II as King brought changed conditions that might have discouraged a less tenacious spirit. Despairing of direct royal aid Phips finally enlisted the subscriptions of several noblemen who with an eye to speculation raised the money to outfit a small merchantman, the *James and Mary*, from the possible profits of which Phips was to have one-sixteenth, the King one-tenth in consideration of letters of patent, and the Duke of Albemarle as chief venturer a still larger share.

The *James and Mary*, accompanied by a tender, sailed from England in 1686 for the north coast of Hispaniola where Phips located the submerged wreck and, after a long and discouraging search by his divers, finally brought up a full 300,000 pounds sterling in plate and bullion.

Returning to London free from the least criticism of his handling of this great treasure, Phips received as his share 16,000 pounds, was knighted by James II (who had touched a handsome fortune from the venture) and took back to Boston a golden cup as a gift to his wife from the overjoyed Duke of Albemarle.

The beautiful medal struck in England in 1687 to commemorate the event (Plate 24) was first described a decade later in Evelyn's *A Discourse of Medals* (London, 1697), page 151, illustration LXXXVII. Specimens are in the cabinets of the American Numismatic Society in New York and the Massachusetts Historical Society in Boston.

A variety of this medal exists, very slightly smaller, with unimportant differences in the obverse but with the reverse showing the wreck more clearly and omitting the rowboat near the *James and Mary*. Both types are rare.

It might be remarked that the Duke of Albemarle, who having previously dissipated most of his fortune, and perhaps thereby been encouraged into this venture which brought him 90,000 pounds as his share, was prompted to have struck in the same year a fine medal bearing his portrait as Lieutenant-General and Governor General of Jamaica, and reading on the reverse EX AQUA OMNIA!

SHEPARD POND

THE BARK *KAIULANI*

ONCE more a square-rigged sailing ship is trading under United States ownership, if not American registry. A steel bark, originally of 1,570 gross tons, the *Kaiulani* was built by Arthur Sewall & Co. at Bath, Maine, in 1899 for H. Hackfeld & Co., sugar planters of Hawaii, and was operated for them between the Islands and San Francisco by Williams, Dimond & Co. of the California port. Although she was named for a Hawaiian princess a story now current that she was intended for a Royal yacht is entirely without foundation.

Even among the many smart sailers of the Island trade the *Kaiulani* had a reputation for speed. However she did not do so well on longer runs, taking 171 days from New York to San Francisco on her maiden voyage, for example. In January 1910 she was bought by the Alaska Packers Association, San Francisco, and renamed *Star of Finland*, while alterations increased her tonnage to 1,699. Her last packing voyage was in 1927, when she sailed from San Francisco to Alitak, Alaska, in 30 days, and was towed back by the steamer *Arctic*.

Her long lay-up at Alameda was broken briefly late in 1936, when she appeared as a ship and as a bark in 'Souls at Sea.' The Association sold her in 1939, and although permission was granted by the Maritime Commission to transfer her to Philippine registry, she was resold to the Hammond Lumber Co., San Francisco, in 1941, and was refitted for the offshore lumber trade under her original name and Panamaian registry.

JOHN LYMAN

Documents

Love and Kisses in Wartime

The following form letter, recently received by one of the Editors of The American Neptune from a member of the Editorial Advisory Board who is now on active duty in the United States Navy, shows at once what a variety of human emotions may be reduced to a standardized form and what an amount of personal news may be communicated without aiding the enemy. A simple series of checks, and the letter is written!

My (dear) (Father) (Offspring)
(dearest) (Mother) (Friend)
(Sister) (darling) (Sweetheart)
(Butch) (Brother)

Hi Toots:

Due to a rigid censorship being placed into effect on both outgoing and incoming mail, and in order to assist the censors, expedite delivery and keep my neck in, I am writing on this form and ask that you pardon the lack of personal touch I would like to convey.

I am (well) (sick) (sober) (weary) (footsore) (lonesome)
and hope you are (same) (happy) (well) (sober)

I received your (letter) (check) (telegram) (package) dated and contents noted. The (money) (sentiment) (candy) (socks) (book) was (delicious) (wormy) (beautiful) and you were terribly (dumb) (sweet) (corny) (atrocious) (thoughtful) (balmy) (lousy) to (think of) (send it to) me.

I went ashore the other day (wouldn't you like to know where???) and (had dinner) (shopped) (fished) (got tattooed, etc., etc.,) (played) (golf) (the horses) (rode the bicycle) (got stewed, etc.).

I met a (friend) (blond) (redhead) (brunette) at the (bar) (hotel) (apartment) (club) (dock) who was (nice) (boring) (charming) (naive) (took me to the cleaners) (pulled my leg).

I have (won) (lost) a (small) (large) sum playing (acey-duecy) (cribbage) (dominoes, plain) (dominoes, African) (poker) (bridge).

I have (had) (not had) opportunity to read (anything) (Bible) (a good book) (mystery) (GWTW) (Police Gazette) (Snappy) and (did) (did not) enjoy it.

My time is pretty well filled up with (eating) (sleeping) (griping) (standing watches) (caulking off) (reading) (studying).

I have sent (money) (allotment) and hope this will keep you in the manner to which I have accustomed you.

How (is) (are) the (kid) (kids) (mama) (papa) (maid)? Give (him) (her) (them) my love.

Mail addressed to me should be sent c/o postmaster _____. In emergency wire me "U.S.S. _____, bureau of navigation, Washington, D.C."

I think of you (often) (continually) (seldom) and wish I could see you.

Keep your (chin up) (chest out) (fingers crossed) (legs crossed) (neck in) (smiling) (tail over the dashboard) and think of me.

Love and kisses (as always) (devotedly) (pip pip) (Tally ho!) (sincerely) (forever yours).

_____
Surname and initials (no rank or rate)

_____
Signature

Queries

20. West Indian Droghers. Information regarding the Droghers and 'Moses boats,' which were formerly engaged in the transportation of native produce in the West Indies, would be appreciated. Are there any models, plans or drawings of these craft available in the East Coast museums or libraries?

R. DE KERCHOVE

21. Osnaburg Cloth. What uses were made of Dutch Osnaburg (sometimes spelled 'osnabrig') cloth on eighteenth-century ships, especially naval vessels? I believe this cloth was used for army tents. Is this correct?

A. T. DILL, JR.

22. Log of *Timoleon*. Does any reader know the whereabouts of the log of the *Timoleon*, Captain Plaskett, reported to have sailed from New Bedford, Monday, 9 October 1843, for the South Pacific, touching at St. Nicholas, Tristan da Cunha, St. Paul, Southwest Cape (Tasmania), Three Kings (New Zealand), Tubuai and Tahiti?

SAMUEL B. GRANT

23. Curtall. What kind of a ship's gun was a 'curtall' or 'curtow,' used in English ships 1531 to 1600? Also 'half curtall'? It is mentioned only as a 'brass pot gun' of 60 pounds. Also were 'slings,' 'bases' and 'murderers' the same? They were apparently used at about the same time. Corbett, Clowes and Norton speak of them as being chambered breach loading guns made of iron of 12 calibre, 30 calibre and 8 calibre, in length somewhat like 'falcons' or 'falconettes.' It is my belief that 'slings' and 'bases' were the same except in bore and length, and 'murderers' or 'murtherers' were a type of early mortar, but I would like any information I can obtain on them.

EDWIN N. RICH

24. Schooner *Doris Hamlin*. The 4 masted schooner *Doris Hamlin* (1063 gross tons, 960 net tons, built in 1919 at Harrington, Maine), for many years owned by William B. Vane of Baltimore and operated by C. C. Paul & Company in the logwood trade between Haiti and Baltimore, stranded in 1939 when entering port at Cape Haitien and sustained severe damage to her underbody. Upon her return to Baltimore a survey disclosed such damage that repairs were deemed inadvisable and she was laid up, but later in the year she was bought by the New York Oceanic Corporation, repaired and refitted for a voyage to the Canary Islands with coal. She sailed from Norfolk for the Islands, but was discovered in distress latitude 35:54N, longitude 74:40W, and was towed back to Norfolk by the Coast Guard, arriving 8 January 1940. On 11 or 13 February 1940 she again sailed from Hampton Roads for the Canary Islands, and as of 30 September 1940 had not been heard from. Did she reach her destination, or was she at some time definitely posted as missing?

ROBERT H. I. GODDARD, JR.

25. George Barrell. George Barrell, who attended Medford School and Phillips Andover Academy, was supercargo of the brig *Venus* that sailed from Boston 13 July 1806 for Gibraltar and Malaga. He returned to Boston in the schooner *Louisiana*. Two books on voyages in the Pacific were written by a George Barrell. Was this the same George Barrell who sailed from Boston in 1806?

E. LEE DORSET

26. Ship *Goddess*. Does anyone know of a picture of the clipper ship *Goddess*, built at Medford, Massachusetts, in 1855 by Hayden and Cudworth?

W. H. WATSON

Answers

THREE-MASTED SCHOONERS. Two additional early United States examples are the following:

1812 *Elizabeth,* 78 tons, built Baltimore 1812.[1]

1835 *Hannah,* 232 tons, built Newport, R. I., 1835 by Silas Cottrell.[2]

JOHN LYMAN

15. CHANT FOR TIMING SALUTES. The chant in use when I joined the Royal Navy not quite forty years ago was: 'If I wasn't a gunner I wouldn't be here, fire one!', and so on. I have never heard of the version ascribed by Mr. Tracy to the Royal Navy, and old gunners I have asked have never heard of it either. If it really was in use at some earlier date, it would be interesting to know when and why the change took place.

C. M. BLACKMAN
Captain, ROYAL NAVY

17. CAULKING IRON. MAKING IRON. In the days of my youth I was given to visiting wooden shipbuilding yards, where two classes of caulking irons were in use.

A. Caulking irons and caulking mallets were used to work the oakum into the seams.

B. Setting or making irons and setting or making mauls were used to set the seams down, either before or after the oakum was worked into the seam, so as to give a solid base for the oakum to rest on or to set the oakum down on this base solidly before the pitch was payed in the seam.

There were several sizes of caulking irons regulated by the width of the seam to be caulked and texture, quality and quantity of oakum used.

The caulking iron was held in the left hand of the caulker, who sat on a box, which served as a seat and container for oakum.

The caulking mallet generally had a round or oval head about twelve to sixteen inches long and two and a half inches or three inches in diameter, bound on the ends with a metal ring. A round handle was inserted in the center of the mallet head, and when the caulker struck the top of the caulking iron, with the caulking mallet, while sitting on the caulker's box, the handle of the caulking mallet was expected to be parallel with the deck, so that the caulker did not have to bend his back more than necessary.

The material used for the head of the caulking mallet was generally *lignum vitae* or locust, which in order to give a certain resiliancy had a seam cut through and through the head on each side of the hole for the handle and extending towards the metal bands on the end of the mallet head.

When well made of first-class material, these mallets gave out a very clear musical note and when much caulking was being done and the caulking mallets were in unison, the sound was far from unpleasant by the water side and carried to a great distance.

The setting or making irons and setting or making mauls were different than the tools used for caulking or working oakum in the seams, being larger, heavier and shaped more like a hatchet with a loose handle, which was attached free to the head of the setting iron, so that when the maul struck the head of the setting iron, there was no shock or vibration carried to the hands and arms of the holders of the handle.This handle was sometimes made of iron and again at times with hazel or other pliable plants that could be bruised and worked

[1] *Ships Documents of R. I., Providence,* I (1941), No. 948.

[2] Ibid., *Newport,* I (1941), No. 842.

round the head of the setting iron.

The setting maul had a short thick barrel-shaped head of hard wood bound on the ends with metal, generally iron, as was the caulking mallet and fitted with a straight round handle.

The sizes varied as did those of the caulking irons and mallets to accord with the depth and width of the seams to be caulked and set.

In using the setting tools, two men were necessary. One man held the setting iron in the seam, while the other struck the head of it with the setting maul, and both moved from four to six inches in unison along the seam after it was set down, as there was great danger of chipping and damaging the edges of the seam of a well-laid deck. With the setting iron it was customary to dip the blade of the setting iron into a pad of oakum kept moist with linseed oil at intervals to keep the loose pitch from clogging up the setting iron and tearing the edges of the seam away.

While the foregoing is in general use for caulking decks, the same with variations of shape and size also applies to the caulking of sides and bottoms of wooden vessels under old conditions. Today much of this work is done with electric tools similar to riveting and drilling equipments.

INMAN SEALBY

19. A BOSTON PACKET. The *Julius Caesar* was a well known Liverpool packet. On 11 March 1824 Rathbone Brothers and Company commenced to advertise in Gore's *Liverpool Advertiser* the *New* Line of Packets for Philadelphia: *Florida*, 520 tons, 20 March; *Julius Caesar*, 346 tons, 20 April; *Delaware*, 412 tons, 20 May; *Colossus*, 399 tons, 20 June; *Courier*, 384 tons, 20 July.

In contemporary Liverpool Directories the *Julius Caesar* was advertised as follows:

1824. Foreign Packet Ships — Philadelphia. *Florida*, Jas. L. Wilson; *Julius Caesar*, F. M. French; *Colossus*, Richard Urann; *Delaware*, John Hamilton; *Courier*, G. Wallace: one of these vessels sails on the 20th of every month. Agents: Liverpool, Rathbone Brothers and Co. Philadelphia, Spackman and Wilson.

1825. A line of Packets to Philadelphia, to sail on the 20th of each month, the *Julius Caesar*, *Colossus*, *Minerva*, *Courier*, and *Delaware*. Rathbone Brothers and Co.

1827. Philadelphia. To sail on the 20th of every month. *Arab*, *Delaware*, and *Julius Caesar*. Rathbone Brothers and Co.

1829. Philadelphia. To sail on the 20th of each month. *Arab*, *Delaware*, *Julius Caesar*, *Ann*, *John Wells*, and *Meridian*. Rathbone Brothers and Co.

The *Julius Caesar* does not appear after 1827. I could give much information regarding this famous packet, but my records are away for safe keeping.

ARTHUR C. WARDLE

News

The Mariners' Museum

Newport News, Virginia. Selections from the Elwin M. Eldredge Collection of steamship material remain on display in the Museum's North Wing, the first section being devoted exclusively to the oils and watercolors of James and John Bard. Supplementing the Eldredge Collection, the Museum has recently received the donation of seventeen contemporary paintings and several prints of Hudson River steamboats.

The Annual Report of the Museum for 1941 gives a record attendance for the year of 150,747 persons. This increase of almost 20,000 from the previous year was largely brought about by visitors from the ranks of army, navy and defense workers, in addition to groups from visiting ships-of-war.

Peabody Museum

Salem, Massachusetts. The reconstruction of the Museum's lecture hall, which began last summer, has been completed, in spite of considerable delays in securing materials. This operation has provided five new exhibition rooms, which will be opened within a few weeks, a bookstack, and additional space for the storage of paintings and manuscripts.

At the 22 December 1941 meeting of the Peabody Museum Marine Associates Charles M. Wright gave personal reminiscences of the late Charles H. Taylor, and of marine collecting in Boston during the past forty years. On 26 January 1942 William U. Swan spoke on 'Early Marine Telegraph Systems in Massachusetts.' On 24 February 1942 Albert T. Gould spoke on 'Thomaston Coasters and their Masters.'

Reprinting of W. P. Stephens' Articles

New York City. Mr. Ridsdale Ellis, 233 Broadway, has had the highly commendable idea of arranging for a reprint of the series of articles 'Traditions and Memories of American Yachting' by W. P. Stephens, which have appeared in recent numbers of *Motor Boating*. The articles will be reprinted, and sold in a cloth binding for $2.00, if a sufficient number of advance subscriptions are received. Mr. Stephens' articles should be preserved in book form, and it is hoped that many readers of The American Neptune will notify Mr. Ellis of their willingness to subscribe for copies of the reprint.

Notes on Contributors to The American Neptune

Samuel Eliot Morison, Professor of History, Harvard University, is lecturing at the Johns Hopkins University during the spring of 1942.

Philip Ainsworth Means has studied Andean history of all periods for more than thirty years, and is the author of many works on the subject.

D. Foster Taylor, who prepared the first survey of the Piscataqua River gundalow while Supervisor for Region 2 of the Historic American Merchant Marine Survey, is at work on a biography of John Peck.

Thomas A. Stevens, a great-nephew of Captain Morrison, has for many years been assembling material relating to Connecticut shipbuilding and maritime history.

A. Alfred Mattsson, a native of Finland, spent ten years at sea in sailing vessels and steamships of different nationalities, and since 1912 has been a watch and clock repairman in Salem.

Oscar Tagle is a Captain in the Navy of Uruguay.

Shepard Pond is President of the Boston Numismatic Society.

Book Reviews

SAMUEL ELIOT MORISON, *Admiral of the Ocean Sea: A Life of Christopher Columbus* (Boston: Little, Brown & Company, 1942). 6½″ x 9½″, cloth. 2 vols., 448 and 445 pages, 34 charts and maps, 16 sketches of vessels, etc., 2 portraits of Columbus, index. $10.00. One volume edition, 680 pages, without footnotes, chapter on Ships and Sailing, chapter on Syphillis, etc. $3.50.

Morison's 'Columbus is a *magnum opus* in the true sense of the term. Those who read this review will already have seen plenty about it in the public prints; such a unique and outstanding piece of historical writing has not appeared for many years. What concerns us here largely is the nautical aspect of this magnificent work; for in addition to its profound historical value, Morison's whole treatment of the subject from a nautical approach has made it a sea book of the first order, one to stand for all time among the few American nautical works that will endure.

It is sufficient only to say, of the historical aspect, that the author sticks pretty closely to the old-fashioned traditional interpretation of Columbus. It is only within the last century that men like Vignaud have raised new theories as to the object and inspiration of Columbus's voyages; that a crop of 'debunkers' has come forward to snap up old tales such as that Columbus had his information of the New World from a man who has already been there; that the *Colón Español, Colom Portugués, Colom Català,* and *Colomb Corse* groups have arisen with their various racial claims and prejudices, and that Madariaga and others have tried to prove Columbus a Jew. Morison rejects all these ideas in brusque Yankee fashion, and produces his reasons. He goes directly back to the four main sources, Ferdinand Columbus, Las Casas, Peter Martyr and Oviedo. 'There is no excuse for regarding Columbus as a man of mystery. His life and voyages are better documented than those of any great navigator or discoverer previous to the seventeenth century.'

In short, Columbus was a Genoese who went to sea and was wrecked into Portugal; the fact that he was a foreigner in Spain later on affected his whole career. Every scholar of the day knew that the world was round; this was taught in the Universities. Portugal was reaching out for a sea route to the East Indies; Bartholomew Dias rounded the Cape of Good Hope in 1488, and Columbus saw him in Lisbon on his return. This finished Columbus's chances with Portugal; he turned to Spain. He did not first conceive the idea of sailing west to reach the Indies; and the whole controversy between him and the Spanish Court, scholars, and theologians revolved around the question of the width of the Western Ocean, not the question of whether the world was round. 'Columbus's scheme of reaching the East by sailing West was in the air for eighteen years before he put it into execution. . . Since there was no doubt of the world being a sphere, almost everyone admitted that Columbus's theory was valid; his originality lay in proposing to do something about it.'

The nautical aspect of the work is nobly introduced by an extensive chapter on

'Ships and Sailing.' Here the author makes several illuminating points that are revolutionary to the popular conception of the Columbus story. The ships of Columbus were not little shallops or clumsy tubs; they were clever and able vessels, as good as anything in their day, or as good as anything of their size for the next three centuries. They made ten knots and more running before the wind; Morison allows them twelve and a half knots in a pinch, which seems excessive. They could easily lie within six points of the wind, and the *Niña* probably could lie within five. Their hulls were of excellent design and substantial construction. In their recent explorations down the East African coast, the Portugese had developed the caravel to a fine point, particularly for sailing to windward on the homeward run. The caravel was a comparatively narrow vessel with pointed ends, usually rigged with two or three lateen sails.

There were plenty of large vessels in that day; Venice had square-riggers of 600 tons or over, and in 1491 there is a record of a Venetian ship of 985 tons sailing to England. 'But Columbus wanted no such big ships as these, since his purpose was discovery and exploration, rather than trading.' *Pinta* and *Niña* were caravels of from 50 to 60 tons burthen, with from 70 to 75 feet overall length between perpendiculars, and 23 to 25 feet beam. They were re-rigged for the voyage with square sails on two masts, thus getting rid of the big awkward lateen sails; it was as if Columbus had a premonition of the special weather conditions he would meet. *Santa Maria*, lost at Navidad on the first voyage, was a small ship-rigged vessel, a little larger than the others, also broader and clumsier. But all told, these vessels were the equal of any craft of their size produced for the next three hundred years; for naval architecture during the sixteenth, seventeenth and eighteenth centuries was simply hanging fire. Indeed, if all the facts could be known, there is more than a suspicion that the design of small vessels would be found to have deteriorated in this period from the excellent type set by the early caravels. At any rate it can be said that the ships of Columbus compared favorably with the topsail schooners and small brigs of 1800 that were sailing out of New England.

It is in this opening chapter that Morison makes the larger point which dominates the whole work; namely, that he is the first seaman-historian of his age. The point cannot be stressed too heavily; no such book as this has been produced in modern times, if ever. The author brings to his task a complete knowledge of celestial navigation, both in practice and history, and a lifetime of experience with sailing craft. From this position, he has dedicated himself to a field survey of the four voyages of Columbus, in the course of which, under sail and in command of his own vessel, he has visited every port, coast and harbor at which Columbus called. He has roamed the Caribbean from end to end on many cruises; he finally organized the Harvard-Columbus Expedition, chartered the big barkentine *Capitana*, crossed the Atlantic to the Azores, went on to Portugal and Spain, visited the Canary Islands from which Columbus took his departure on the first voyage, and followed his course to the landfall in the West Indies and beyond. No stone has been left unturned, no loophole unexplored; the job is complete to the last detail and seamanlike to the last word—and it is a job the like of which has never before been done. The spirit of the sea imbues the whole work, and makes it primarily a study in practical seamanship; so much so that those who do not understand the sea will hardly grasp the deep significance of much that is being said.

Out of this survey and the resultant analysis, appears an estimate of Columbus that is entirely new in history. Columbus, it seems, was an expert seaman for his day. No sailor in 1492 could get a latitude except from Polaris, and in the equatorial regions Polaris was of little or no account; the method of taking a meridional altitude of the sun and applying declination had not yet been worked out for seamen. Men went ashore to get the altitude of Polaris with an astrolabe. Columbus never had an astrolabe, or even a cross-staff, though pictures of him using both are common. The only instrument he is known to have had for the determination of latitude was an ordinary wooden quadrant, 'with sights along one edge through which the heavenly body could be lined up, a plummet attached to the apex by a silken cord, and a scale of 90° on the arc, from which the altitude could be read as cut by the cord at the moment when the sun or star was lined up through the sights.' And with this instrument Columbus on a famous occasion was 20° off in his latitude, through shooting another star, Alfirk (β Cephei), for Polaris; a fact discovered by Morison. As for longitude, there was nothing but dead-reckoning, except the chance timing of an eclipse; and on the two opportunities he had to observe the latter, 'he muffed both, as did almost everyone else for a century.'

Thus, although Columbus liked to think of himself as an astronomer, he was 'to all intents and purposes a dead-reckoning navigator pure and simple.' But so was every other navigator of his day. And as for his dead-reckoning, it was positively uncanny in its accuracy and general ability. One has to bear in mind that in sailing from the Canaries on the first voyage, Columbus plunged into the unknown without a chart. He had a perfectly good compass, probably as good as many a dry boat compass of today. At any rate, it was with this compass that he detected the zone of no variation when he crossed it, and thereafter recognized a zone of westerly variation; although the phenomenon was inexplicable to him, and was denied by the scholars on his return. This alone is a full testimonial to his sense of practical navigation. But he had no log, and estimated the speed of the vessel with his eye; careful plotting of the course of the first voyage by John W. McElroy shows that Columbus had a habit of over-estimating his speed by about nine per cent. Yet since this was a pretty constant factor, it made little difference in the matter of the return to Europe. Luckily all the voyages were made in waters that offered little ocean current, the bane of correct dead-reckoning anywhere.

It is rather a pity, by the way, in plotting the course of the return first voyage, that the ratio of nine per cent over-estimate of speed was not strictly held. Morison says (I, 414, note 1) that McElroy found it necessary to apply a fifteen per cent correction in this regard as the Azores were approached, but that a leeway allowance while the *Pinta* and *Niña* were sailing on the wind could have taken up this difference. Why did they not work backward from the Azores, using a known date, and applying the nine per cent distance correction plus a leeway allowance, since nine per cent seemed to be the correct factor in Columbus's case? The point, however, is of little importance.

With the situation that confronted Columbus clearly in mind, the constant record of his successes in finding his way about by dead-reckoning is astounding. He made the Azores on the return from the first voyage; and while this may have been somewhat of a lucky break, his journal shows that he knew fairly well where he was. On the return from the second voyage, he made the coast of Spain with a mistake of

only thirty-five miles in his landfall. 'On the third voyage he found his way to Hispaniola by a very circuitous approach; on the fourth voyage he hit the Antilles within fifty miles of where he wished to be, and after sailing back and forth for months between Nicaragua and Darien, he knew just where Jamaica lay.' It is hard to explain to the landsman the importance of these feats; they could have been achieved only by the most meticulous daily and hourly record and observation, added to a sixth sense of location which few men, and indeed few seamen, possess to the full. The truth is that in the midst of unknown waters, Columbus seemed always to know where he was; and the proof of it lies in the fact that he always arrived at a known destination.

In this brief summary it is impossible even to suggest the wealth of material that Morison has brought to bear on his subject, or the power and ability with which he has set it out. Written with a narrative flow from beginning to end, the book reads like a splendid story. The documentation is erudite and positive; some of the jolliest writing in the book is in the footnotes. The charts, maps and sketches are extensive and seamanlike; wherever the need arises in reading, the appropriate map or design is there at hand. The first voyage of Columbus, the only one on which there is any accurate navigational data, is shown day by day on a splendid folding chart prepared by John W. McElroy and executed by Erwin Raisz. All told, it looks like the last word on Columbus for a long time—until some new sources by chance come to light. A couple of typographical errors need to be noted. In the chapter on 'Ships and Sailing,' page xxxii, second paragraph, Course A and Course B seem to have got interchanged. And in Vol. I, page 103, footnote at bottom of page, the factor for converting nautical miles to statute miles is 1.1515, not 1.515. It is a wonder, with such voluminous and intricate footnotes, and with a text replete with signs, symbols, figures and odd phraseology, that such a correct job of proof-reading has been done.

Searsport, Maine LINCOLN COLCORD

HOWARD I. CHAPELLE, *Boatbuilding, A Complete Handbook of Wooden Boat Construction* (New York: W. W. Norton & Co., Inc., 1941). 6¼" x 9½", cloth. 624 pages, many plans, sketches, index. $5.00.

In recent years there has been a great multiplication of books purporting to explain to the inexperienced person how to build a boat. Such so-called amateur building has increased enormously in the last twenty years, paralleling the enormous increase in production of inexpensive bench woodworking tools, powered with electric motors small enough to be plugged into any electric socket. In some sections government registry figures show that fully a third of all new boats registered have been built by their owners.

Unfortunately, many of these books have been put out by professional hack writers, with little if any knowledge of the subject, merely copying and compiling from previous books, and adding scraps of hearsay, with some purely imaginative fancies. Such books naturally perpetuate old errors and bad methods. Although Mr. Chapelle acknowledges his indebtedness to many previous writers, his own long practical experience and observation of boat building has enabled him to avoid

these pitfalls. The methods he advocates are essentially sound. His advice on what to avoid is always good, sometimes invaluable.

Nevertheless, this reviewer, speaking from experience of over twenty years in supplying plans to amateur builders, and then answering their questions about their building difficulties, must pronounce the book unsatisfactory. The trouble is simply that it is too much of it. It is really three books inextricably churned up in one mixture and bound in one cover. Instead of being a handbook for the practical worker, it is an encyclopedia more suited to the reference library and the historical collection. It is not a practical tool for a busy workman.

Mr. Chapelle's active mind simply cannot hew to one line. 'Boat' means, for all practical purposes, craft not over thirty feet in length. Yet many a page of this book is spent on description of methods, and even tools, of no use in boat building, and applicable only to big seagoing ships. It is little short of criminal to tempt the amateur, with a few words of instruction, to meddle with the broad-ax and ship adz, the two most dangerous tools ever made by man, and completely unnecessary in boat building. And regrettable that there is not one word of mention of the little one-pound, one-hand adz—the *skeparni* of the ancients—which is immeasurably the oldest and most used boat-building tool in the world, and still one of the most useful and versatile, and as safe as any edge tool can be.

Digression into the field of shipbuilding, however, is a minor matter compared to countless digressions into the field of design. A man whose problem is the construction of a boat according to a selected design is not helped by a dozen sketches of variants on that design, in whole or in part, with a lengthy discussion of the merits and demerits of each. Mr. Chapelle should make up his mind whether he wants to write a book for the workman in the shop, or a book for the student in the classroom of naval architecture.

Probably the most valuable chapter in the book is the one explaining the process of laying down full size lines—a process referred to throughout this book as 'lofting,' a rather unfortunate choice of a colloquialism that is used in only a few localities. This is the instruction most sorely needed by all amateur and not a few professional builders. Nothing in boat building is more often skimped or shirked than this job; yet it is the one and only foundation on which a good boat can be built. While every process of laying down is absurdly simple, and can be quickly and easily taught to any average twelve-year-old child by personal instruction and example, it is not easy to explain in printed words. Mr. Chapelle has done as well as could be expected, with the aid of many drawings showing each successive step of the job.

An interesting feature of the book is the inclusion of complete working drawings for many small boats. But, although these are thoroughly sound craft, they are all of outmoded types, and will probably have little appeal to the young men of today, who apparently yearn to build only the very latest fads of yachting fashion.

It is entirely possible that if Mr. Chapelle could bring himself to issue a severely revised edition of this book, cutting the number of pages, and the price, to half or less of the present figures, it would become the most valuable and widely used book in its field.

JOHN G. HANNA

Dunedin, Florida

JOHN STEINBECK and E. F. RICKETTS, *Sea of Cortez* (New York: The Viking Press, 1941). 6″ x 9½″, cloth. 598 pages, 40 plates (8 in color), 2 isotherm charts, map on end-papers, index. $5.00.

Recent voyages of research by the vessels *Zaca, Velero III* and *E. W. Scripps*, plus the older work of the *Albatross*, have made the Gulf of California, at least from the oceanographic standpoint, one of the best known bodies of water of its size in the world. To this growing body of literature, *Sea of Cortez* adds a lively account of a collecting trip in a chartered fishing vessel, as well as a bibliography of the littoral fauna of the region.

Mr. Ricketts, who runs a biological supply house on the shores of Monterey Bay, and Mr. Steinbeck, whose previous writings had given little indication of a scientific propensity, set out from Monterey with a crew of four in the 76-foot diesel-engined purse-seiner *Western Flyer* in March, 1940. They touched at San Diego, rounded Cape San Lucas, and spent four weeks in the Gulf collecting along the west shore up to Angel de la Guardia and back down the east shore as far as Topolobampo. They had few adventures, because they were not seeking adventure; they went to catch and preserve marine animals that could be sold again, and this pursuit occupied nearly all the time of the six men. It is the very lack of adventures that gives the first 271 pages of the book its flavor, for instead of filling it up with accounts of what they saw and did the authors have room to give us their philosophy of life and love: the effect of the moon on organisms, the pitfalls in teleological thinking, aphrodisiacs, the geological origins of the Gulf.

If, then, as an account of a sea voyage, there is little of interest in the book to the nautical historian, its scientific shortcomings are even greater. The authors' purpose, so they tell us in their introduction, 'was to observe the distribution of invertebrates, to see and record their kinds and numbers, how they lived together, what they ate, and how they reproduced.' In this respect they have notably failed. Marine organisms are inextricably bound up with the chemical and physical characteristics of the sea water in which they live. Practically all of them spend their youth as microscopic plankton, drifting with the currents to a favorable spot or being eaten by something larger before they get there. But we are told nothing of these variables, only the bare lists of forms taken at each collecting station; and although a great deal of emphasis is laid on the Panamic character of the fauna of the region we are left almost completely in the dark as to why one region should be any different from others in the first place.

The remainder of the book includes photographs and drawings of a number of the animals collected (it is a pity a photograph of the *Western Flyer* was not included), directions for preserving specimens, a glossary of biological terms, and a list of species collected with exhaustive literature citations.

John Steinbeck is always interesting reading, and he has a particularly soft spot in his heart for the natives of Mexico, so that some of the best parts of the narrative deal with the expedition's brief encounters with the inhabitants of Lower California. Elsewhere situations are occasionally overworked for humor. The boating magazines long ago extracted all the risibles from outboard motors and the *Coast Pilot*, but as the authors are new to the sea this can be forgiven them.

Dahlgren, Virginia JOHN LYMAN

HAROLD W. THOMPSON, ED., *The Last of the* Logan: *The True Adventures of Robert Coffin, Mariner in the Years 1854 to 1859* (Ithaca, New York: Cornell University Press, 1941). 5¼″ x 7¾″, cloth. 214 pages, frontispiece, end-paper maps. $2.00.

One gathers the impression from the accounts of shipwrecks and cast away sailors in the South Pacific, that the Fiji Islands were the favorite locality for this form of early nineteenth-century adventure. *The Last of the* Logan is an account of the maritime wanderings of Robert Coffin during the years 1854 to 1859, and the high point of the book is the author's shipwreck in the Fiji Islands and his stay with the natives there; an account which compares favorably with similar narratives.

Coffin was a member of the prolific Nantucket family of that name, whose grandfather had migrated to Dutchess County, New York. At the age of twenty-one he shipped on the whaler *Logan* (formerly an East-Indiaman) of New Bedford for a cruise to the Pacific. In 1859 he returned to the United States, retired from the sea and, over fifty years later, wrote the present narrative from memory. The editor tells us that although two versions were used to make up the manuscript the result is substantially as the author wrote it. Professor Thompson has, however, sensibly divided the book into five chapters dealing with whaling, the shipwreck, the stay in the Fijis, the author's adventures in the Australian bush and his gold mining activities. Coffin was a far better writer than most sailors and his descriptions of harpooning whales, the wreck of the *Logan*, life in the Fijis and the Australian gold rush are vivid, excellent reading.

Coffin's acquaintance with the obscure David Whippey, one of the most influential men in the Fijis at this time, is of considerable historical interest as is his relationship with Captain Thomas Dunn. Captain Dunn appeared in the islands with the Salem bark *Dragon* to collect *bêche-de-mer* for the China trade. Coffin worked for Dunn and secured for himself passage to Australia in the *Dragon*.

In the rather lengthy introduction there are, unfortunately, several factual errors. The Fiji Islands are the easternmost group in Melanesia and not the 'most important archipelago in Polynesia' (p. 20) which contains both the Hawaiian Islands and New Zealand. The terms Melanesian and Papuan are not synonymous in modern usage as is indicated on page 21, and while it is not exactly untrue it is misleading to call Fijian pottery 'the finest to be found in the South Seas.' Fijian pottery is a comparatively poor grade product, but it is practically the only pottery in the Pacific east of New Guinea.

ERNEST S. DODGE

Peabody Museum of Salem

JOHN C. VOSS, *The Venturesome Voyages of Captain Voss*, With an introduction by Weston Martyr (New York: Dodd, Mead & Company, 1941). 4¾″ x 7¼″, cloth. xvi + 326 pages, 8 illustrations, maps on end-papers, index. $2.75.

This classic of the sea was first published obscurely in Japan (not in China, as stated on the dust cover) in 1913, and remained relatively unknown until it was republished in London in 1926. Although two cheap editions have appeared since that date the book has been out of print for some years, and this third reprinting is therefore most welcome.

The first 45 pages of the book tell the story of Captain Voss's treasure-hunting expedition from British Columbia to Cocos Island, performed in the 10-ton sloop *Xora*. They are interesting chiefly because they record his first experiences with a small craft in the open ocean. The concluding 30 pages describe his well-nigh incredible adventure in the *Sea Queen*, which sailed from Yokohama, was caught in a typhoon, turned turtle, but after an interval righted herself and lived (as did her crew) to sail another day. The bulk of the book is devoted to the 40,000-mile cruise of the famous *Tilikum*, in which Captain Voss sailed from Victoria, British Columbia, in May, 1901, and in which he arrived at Margate, England, 3 years, 3 months, and 12 days later, after a voyage which had taken him to Samoa, Fiji, Australia, New Zealand, the New Hebrides, Thursday Island, South Africa, Brazil, and St. Helena. Voss tells us that his purpose was to circle the globe in a smaller craft than Captain Slocum's *Spray*, and for the purpose he chose an old Indian dugout canoe, some 30 feet in length. Skilfully strengthened, decked over, and rigged, she proved amazingly seaworthy.

As this printing of the *Voyages* follows the text of the original edition, it gives no account of the history of the *Tilikum* since 1926. At that time she was owned by Messrs. A. W. and E. Byford, of the Greenwich Yacht Club, and had fallen into a sad state of disrepair. A few years later H. T. Barnes, of Victoria, learned that she was still in existence, and suggested that an effort should be made to have her brought back to British Columbia. At first she could not be found, but eventually she was located by advertising in English yachting magazines. Messrs. Byford coöperated gladly, and agreed to present the *Tilikum* to the City of Victoria, on condition that no admission charge was made when she was placed on display. Messrs. E. H. and H. H. King, Victoria agents of the Furness Line, next became interested, and succeeded in persuading the Company to transport the *Tilikum* free from London to Victoria, where she arrived safely in July, 1930. She was repaired after a fashion and placed on exhibition, but those most interested in her history and preservation were still far from satisfied. At last in 1940 the Thermopylae Club, the membership of which is composed of mariners and shiplovers, secured permission to give her a thorough overhaul, and restore her to her original condition. The work was done by Captain Victor Jacobsen, himself a famous skipper of the old sealing days. Repairs having been completed, the *Tilikum* was moved in December, 1940, to a new site alongside the totem poles in Thunderbird Park, Victoria.

Voss states that when he acquired the *Tilikum* in 1901 she was already fifty years old, which means that her stout old cedar hull is now nearing the century mark.

W. KAYE LAMB

University of British Columbia

RUSSELL OWEN, *The Antarctic Ocean* (New York: Whittlesey House, 1941). Octavo, cloth. xiii + 254 pages, 12 maps by Stephen J. Voorhies, 15 plates, index.

In view of the fact that current maps do not indicate any such body of water as the 'Antarctic Ocean,' Mr. Owen explains that he is dealing with the ice beset seas bordering the Antarctic Continent – the southern limits of the Pacific, Atlantic, and Indian Oceans. More specifically his story is an abridged record of some of the adventures

experienced by mariners and explorers during the past 120 years in their search for the Antarctic Continent.

Mr. Owen has admittedly borrowed heavily for the material prior to 1902 from Dr. Hugh Robert Mills's masterful historic work, *Siege of the South Pole*. Mr. Owen, in condensing Mills's material, does so in a free and non-technical style, adding first-hand comments from his experience as a news correspondent attached to the first Byrd Antarctic Expedition, 1929—a first-hand Antarctic experience which the eminent Geographer Mills unfortunately never had.

The Antarctic Ocean is purely a popular account and, therefore, lacking in technical facts. There is no discussion of the physical aspects of the oceans or their ecology. In fact, the author's limited Antarctic experience has caused, in some cases, an incomplete picture of conditions as a whole. That is, his discussion of the animal life inhabiting the Antarctic oceans is limited to a few of the birds and animals of the Bay of Whales and makes no mention of the myriads of birds and aquatic life that inhabit the Southern oceans.

The author traces the history of discovery with the colorful account of the early British, Dutch, and Spanish. He retells the story of Captain James Cook's circumnavigation of the *terra incognita*, and then takes up the discussion of who first discovered Antarctica, showing that the weight of evidence is in favor of the American sealer, Captain Nathaniel Palmer in 1821.

The voyage of the Russian Bellingshausen is quickly passed over to brief accounts of the British sealers, Weddell, Biscoe, and Balleny. The adventures and misadventures of the voyages of Wilkes and the U. S. Exploring Expedition follow with a brief mention of the French Dumont D'Urville and the British Ross who were at the beginning of the so-called 'golden age of Antarctic exploration.'

After a period of comparative oblivion new interest is taken in Antarctica, a 'renaissance' period, and the cruise of the *Belgica*, captive for a year in Antarctic pack ice, proved that men could exist through an Antarctic night.

After the turn of the twentieth century the author brings his book to a conclusion with the reviews of several recent expeditions, including the work of Scott, Shackleton, and some mention of Amundsen.

That the author has not attempted a full history of Antarctic exploration as is evidenced by the failure to include mention of important work by Charcot's two voyages, Bruce, Von Drygalski, Filchner, Nordenskjold, Borchgrevinck, the *Challenger* expedition et al. The modern era of exploration is depicted by brief accounts of the first two Byrd expeditions and mention of the work of Ellsworth and Wilkins; however, the work of Mawson, Rymill, the Norwegian whalers—the *Schwabenland, Discovery II**, *and William Scoresby*—and the United States Antarctic Service expedition is neglected, even though some of these have added the bulk of our knowledge to the Antarctic oceans and coastlines.

Mr. Owen has given much more concern to the Pacific and Atlantic areas than to the Indian ocean. Unfortunately, his book was published before the full account of the filling in of 1,000 miles of the Southern Pacific coastline of Antarctica was available from the 1940-41 work of the United States Antarctic Service. However, evi-

* The Discovery Committee in Great Britain has sent the *Discovery II* and *William Scorsby* on several routine circumnavigations of Antarctica in recent years for detailed oceanographic records of the seas under discussion by Mr. Owen.

dence that he purposely omitted material at hand is pointed out by the fact that he included six pictures, credited to *Wide World*, taken by the United States Antarctic Service in 1940, one of which faces page 96, erroneously titled '. . . Mt. Erebus, the only known live volcano in the Antarctic,' but which is actually United States Antarctic Service Official Photograph No. 269 of Mt. Melbourne, located on Terra Nova Bay, South Victorialand.

In conclusion Mr. Owen raises the question of 'What is it worth? (Antarctic exploration). Aside from scientific information, he answers, 'Absolutely nothing!' When speaking of land for colonization or for economic value, his dogmatic statement is probably true, but with wars raging, due in part to economic mineral shortages, how can we be certain what is of value in a land that has hardly been explored except for a few small areas. Once Alaska and Greenland were thought useless, too.

PAUL A. SIPLE

JOHN PHILIPS CRANWELL, *The Destiny of Sea Power* (New York: W. W. Norton Company, Inc.). 5½" x 8", cloth. 262 pages. $2.75.

Since the date of this book's publication (1 December 1941) the vast area of the Pacific has been annexed to the laboratories of world sea power. The events unfolding there, however, would have little effect on the basic content of this extraordinary treatise. As the fog of war's censorship gradually clears away in years ahead we shall undoubtedly find further substantiation of Mr. Cranwell's doctrine.

Because this book is an outline of parallel evolution of the three arms of war on land, sea and air with basic conclusions not yet practically arrived at, it is a text to be studied thoroughly. Proceeding logically with the Doctrine of Sea Power and mechanization beginning afloat the author sets forth the similar courses of the three fundamental means of warfare. Herein are discussed in some detail their similarities in methods of operation, common reliance on bases and the importance of the cannon as their primary weapon. So far so good. The examples are all sound and arguments watertight. The author even shows a remarkable impartiality in the conflict of the airplane vs. the battleship. But to go on; in the discussion of the Doctrine of Air Power one statement stands out as phenomenal; —'as aerial commerce increases in quantity and importance and by that much decreases sea-born trade, the influence of air power on history will be substituted for the influence of sea power on history.' Notice, this is no compromise—for sea power will be substituted air power. In this statement lies the key to the destiny of sea power. Only the future holds the proof of such a theorem. So before this book takes a place on the same shelf as that of one Admiral Mahan a long mechanical and economical evolution must write itself in history.

The author continues with many convincing arguments tying together the various spheres of the three powers and finally stitching them with the 'Lessons of History.' It is, however, noticeable when the discussion is not confined to historical precedent and actualities the conclusions, predictions and analysis are often based on theories of an impractical nature. For example, in the advocation of air support integral with ocean convoys the author cites the possible use of flight-deck merchantmen and an increased number of fighting planes for cruiser catapults. The consider-

ations involved in combining a tanker and air craft carrier of even limited plane capacity do not allow for the essential maintenance and repair facilities to say nothing of protected hangar space, personnel requirements or the adequate flight deck on which a carrier's dimensions must be based. The catapult plane on a cruiser if it is to return to ship must be a sea-plane with the essential pontoon. This restricts its performance aloft to observation and limited scouting,—a chicken among eagles when opposed to fighter planes.

Undoubtedly in the future these technical and enginering problems will gradually be levelled until the pattern for war follows somewhere near the logical course plotted by Mr. Cranwell. It is doubtful whether the ideal of air power replacing sea power will ever be approached until nations at peace are allowed to develop a normal growth of air commerce.

The book's most interesting discussions include many revealing naval triumphs and disasters not generally known of the present conflict. Interesting, too, is the preliminary definition of sea power. To the author's constituents of sea strength might be added the intelligence, skill and courage of the personnel wherein Japan has attempted to substitute the ersatz of treachery and infiltration.

T. C. GILLMER

Annapolis, Maryland

Essays in Modern English History in honor of Wilbur Cortez Abbott (Cambridge: Harvard University Press, 1941). 5½" x 8½", cloth. xii + 404 pages, portrait. $3.50.

The variety of subjects treated in the average *festschrift* makes such a book a commercial trial to its publisher, however great satisfaction it may give to its compilers and recipient. The present volume of essays, dedicated to Professor Abbott by his former students at Yale, Harvard and Radcliffe, has no lack of variety, but Walter S. Hayward's article on the Penobscot Expedition and Robert G. Albion's 'Maritime Adventures of New York in the Napoleonic Era' should bring the Harvard University Press a certain number of orders from readers of the NEPTUNE.

W. M. WILLIAMSON, ed., *Cornell's Sea Packet 1942* (New York: Cornell Maritime Press, 1941). 5" x 8", cloth. 148 pages, foreword by Gordon Grant, illustrations. $2.00.

This *Packet*, issued by the publisher of many useful modern technical books, is the first of a proposed annual, presenting some fifteen separate articles, many of which originally appeared in our late contemporary *Fair Winds*. Some of the articles suffer from an excess of 'salty' flavoring, but the following are of historical interest: 'An Old California Shipbuilder [Matthew Turner]' by John Lyman; 'The Wild Ship of the Atlantic [Clipper *Dreadnought*]' by W. M. Williamson; 'The Evolution of Navigational Instruments' by Samuel G. Mellor; 'The Atlantic Ocean before Columbus' by Frederick J. Pohl; 'Raft-Ships' by Coley Taylor; 'Joseph Conrad; Master Mariner' by Williard Carl Hahn.